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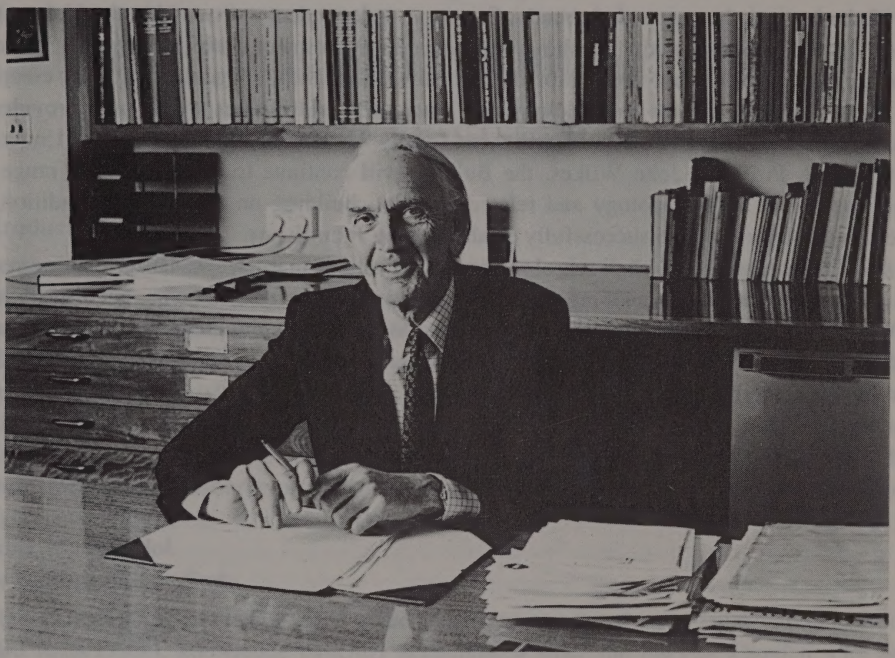
Professor John Evans, Editor 1973-1989



This volume is the first to appear since John Evans relinquished the editorship of the Bulletin on the occasion of his retirement from the Directorship of the Institute of Archaeology in July 1989. In addition to his many duties and obligations he assumed the editorship on his appointment as Director in 1973 and was responsible for the publication of more than half of the volumes in the series that have appeared since the Institute was founded fifty-three years ago. More than that, we owe to John Evans the present scale and range of interests of the Bulletin, in which he sought to represent fully the exceptional breadth of archaeological studies undertaken at the Institute. We also owe to him the role of the Bulletin as a journal of record through the steady increase of space devoted to book reviews, generously (if not always expeditiously!) contributed by many for whom the Institute Library has been an indispensible source for scholarship. As many friends and colleagues witnessed, the tasks of editorship—in which he was assisted by his secretary Mrs Marjorie Hunt as well as by successive Librarians of the Institute, Gerry Talbot, Heather Bell and Brenda Cook—were undertaken during years crammed with other activities, when John was playing a leading role in promoting archaeology both within and outside the University, including his service first as Director and then as President of the Society of Antiquaries of London.

All these activities, together with his editorship of the Bulletin. made heavy demands on John's time, but he still gave generous attention to the work of colleagues and pupils. His long association with the Institute, as Professor of Prehistoric Archaeology from 1956 to 1973, and thereafter as Director, witnessed many changes. Since the admission of undergraduates in 1968 the Institute has expanded greatly, first as an independent entity within the University, and, since 1986, as a major teaching and research department within University College London. Indeed, it was the unification of the Institute with the College that led to the creation of UCL's new Centre for Archaeology and Ancient World Studies which now provides a focus for over fifty academic staff from some twenty arts and science departments. Under its new Editor, Professor John Wilkes, the Bulletin will continue to present a wide range of published work in archaeology and related subjects, building on the editorial tradition of breadth and excellence so successfully established by John Evans.

Within the Institute we shall miss John and Eve Evans in many ways. The prevailing sense of fellowship among all who work within it, not only teachers and students, but also library, administrative and domestic staff, owes much to their sustained contribution to the life and work of the Institute over more than three decades. We wish them many years of happy and productive retirement.

David Harris, Director

John Wilkes, Editor

Celtic Coins Found in Britain, 1982–7

by COLIN HASELGROVE†

Introduction

Ever since the late Derek Allen compiled his massive gazetteer of findspots of Iron Age coins in Britain (Allen, 1960), new material has continued to accumulate at an ever-increasing rate. Two supplements updating the previous lists have already been published (Haselgrove, 1978; 1984) and this third article deals with coin finds noted by the author over the following five years, many of them while undertaking a detailed study of the archaeological contexts in which Iron Age coins have been found in south-east England (Haselgrove, 1987). New finds are listed here following the same basic conventions as in the previous publications; for reasons of space, the source of information for each discovery is normally restricted to a single item.

The pattern of new finds

In his gazetteer, Allen (1960) listed some 10,067 provenanced coins from Britain, mostly hoard finds (79%), knowledge patiently accumulated since the days of Camden, Plot and Stukeley and first brought together in the pioneering work of Sir John Evans (1864; 1890). A further 4632 have since been listed (Haselgrove, 1978; 1984) and this gazetteer contains entries for 6302 more coins, giving a total of 20,987 provenanced coins. In just thirty years then, the total number of recorded Iron Age coin finds has more than doubled, quite apart from those discoveries which have escaped notice or appeared in the trade lacking any indication of their provenance (Note 1).

The main factors behind this dramatic upsurge in finds are the increased number of excavations (and improved excavation techniques) on one hand and inevitably, the advent of metal detecting as a popular pursuit on the other. Between them, these have also resulted in a significant shift in the type of information available. Thus, while the proportion of stray finds (10%) has remained all but constant, the figure for sites (24%) has risen sharply compared to 1960 (9%). In the South-East at least, the number of excavation finds is five times what it was in 1960. Then, only three sites had coin lists of more than ten from 'controlled' excavations. Now, however, there are 18—seven of them with over 100 coins each: Baldock, Braughing, Canterbury, Colchester and the Harlow, Hayling Island and Wanborough temples. In the South-East alone, well over 100 settlements now have excavated coin finds (Haselgrove, 1987), holding out prospects for successfully tackling questions relating to the circulation and

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function of Iron Age coins which would have seemed impossible only a few years ago.

Outside the South-East, in the territories ascribed to the Corieltauvi (formerly Coritani; Tomlin, 1983), the Dobunni, the Durotriges and the Iceni, the increase in site and excavation finds is just as marked. The Corieltauvian region, for example, now has fourteen certain or probable major settlements with Iron Age coin finds, nine of them with 25 or more coins (May, 1984). In East Anglia, the important collection of finds from Weycock Hall, Saham Toney, has recently been published (Brown, 1986), and a similar concentration of surface finds is reported from near Stonea Grange (A. Chadburn pers. comm.). Over 60 separate sites in Dobunnic territory have produced finds, including an interesting group from the settlement area outside the Kingsholm legionary fortress (Haselgrove, forthcoming).

Equally, recent publication of several sites excavated during the late 1960's–early 1970's boom, e.g. Baldock (Stead and Rigby, 1986), Harlow Temple (France and Gobel, 1985), Sheepen 1970 (Niblett, 1985) and Puckeridge-Braughing (Potter and Trow, 1989) has provided much-needed information about the associations and stratigraphic context of coins in the previous listings (Haselgrove, 1987). Excavation has subsequently resumed at both Baldock (1980–7) and Harlow Temple (1985–7) yielding further important finds. The latter site has now produced more excavated Iron Age coins than any other site in Britain apart from Hengistbury Head, and work is scheduled to continue at least until 1989 (Bartlett, 1987). Paradoxically, the few coins from the 1979–84 excavations at Hengistbury (Cunliffe, 1987) have exposed the quite exceptional nature of the 1911–12 finds (cf. Allen, 1960), which relate almost exclusively to the metalworking activities being carried out there. They are no more losses from use than were the coins deposited as offerings at Harlow Temple after the Conquest. Other recently excavated sites included in the new listing include Bagendon-North Cerney, Canterbury, Hayling Island Temple (1981–2) and the Silchester Forum Basilica. Among the important new hoards which have come to light are a find of 2000 early British potins from the Thurrock area, Essex, two more gold hoards from Snettisham, Norfolk and others from Southend-on-Sea, Essex, Ashurst and Whitchurch, Hampshire and Chute, Wiltshire (Cowell et al., 1987), as well as additional finds from Cheriton, Hampshire. There have been several finds in Durotrigian territory: Corfe Common; Donhead St Mary; Fordingbridge; Shapwick-Badbury Rings; and Winterbourne Monkton. Two Icenian finds from Scole, Norfolk and Stonea, Cambridgeshire, are also listed in full for the first time.

The sorry tale of what happened at Wanborough, Surrey, is now well-known (e.g. CBA Annual Report 1985; Surrey Archaeological Society, 1988). The first discoveries were made in 1983, but once knowledge of the site became public in 1985, it was extensively looted. A rescue operation was mounted, uncovering the remains of a Romano-Celtic temple, which in turn sealed a black layer dated c. AD 50–150 containing burnt bone, pottery and a series of wholly exceptional bronze religious objects such as four ceremonial headdresses, one complete sceptre and fifteen handles. Around 400 more Iron Age coins were found (Note 2); these are now thought to have come originally from the clay surface beneath this black layer (Surrey Archaeological Society, 1988). At the time, the Surrey police estimated that up to 5000 coins had been taken from the site (Surrey Archaeological Society, 1988) but it now seems improbable that the find was so large (J.P.C. Kent pers. comm.). Kent puts the overall figure

nearer 1500 and certainly no more than 2000. Altogether, nearly 1000 Iron Age coins from Wanborough, including the excavation finds, are now under study at the British Museum; these appear to be representative of the find as a whole, which is dominated by issues of the southern rulers: Tincommius, Eppillus and especially Verica and Epaticcus. Only the coins now at the British Museum are included in this gazetteer.

Classification and metal analysis

This doubling of the number of Iron Age finds in the last thirty years has had no less dramatic an effect on our knowledge of new coin types. As many as 200 new types and varieties have come to light since the last edition of Mack (1975) appeared (an increase of 34%), giving a total of over 750. Only with gold types, largely hoard and stray finds, have recent discoveries had relatively little impact on the overall picture. For bronze and especially silver, the opposite is true, nearly 50% of the latter being new. If modern finds are typical, e.g. at Chichester, Silchester (Boon, 1985), or Saham Toney (Brown, 1986), the small size of the silver units and fractions meant that they were often missed in earlier excavations. As a result, many 'modern' studies, such as Allen's (1970) of the Icenian coinage are already significantly outdated. It is salutory to reflect that Evan's original arrangement (1864), which still forms the foundation of the existing classification, was based on only 34% of the types now on record, and even Allen in 1960 had no knowledge of 28% of them.

Unfortunately, Van Arsdell's (1989a) new listing of British Iron Age coin types had not yet appeared when this gazetteer was compiled. Nor, for reasons of space, could previously unrecorded types be described in detail here. However, in many cases the summary identifications should permit their correlation with Van Arsdell's types. A source of more detailed information is given where available and photographs of most coins may be found in the Index of Celtic Coins kept at the Institute of Archaeology, Oxford, where they may be inspected by arrangement (Note 3).

Other recent and forthcoming publications relating to the classification and chronology of Iron Age coinage, or with bearing on its circulation and purpose, are listed in the bibliography. Chief among these are Nash's (1987) general study and a detailed reappraisal of the coinage attributed to the Durotriges (Mays, forthcoming). Other recent studies include articles on the coinage of the Dobunni (Sellwood, 1983; 1984a) and that of Amminus (Nash, 1982). The relationship between British and Continental coinage—both gold and struck bronze—is also evidently more complex than Allen (1960) allowed. Recent finds in France suggest that a number of types hitherto considered British are, in fact, Gaulish. These include a group of British Q staters struck on a 5.9 gm standard in yellow gold, which explains the rarity of Gallo-Belgic F coins in Britain (Haselgrove, 1987), and a bronze inscribed by a Dubnovellaunus (Mack, 1975, 291a; Delestree, 1977). Mack (1975) 280d is also a Gaulish type (Scheers 1977, No. 80e). Conversely, it now seems likely that at least some of the closest potin imitations of Massalia bronzes found in Britain are of insular manufacture rather than imports from Central Gaul as has generally been assumed (Haselgrove, 1988). Similarly, classes of Gallo-Belgic C and E gold which were almost certainly struck in Britain can now be isolated (Haselgrove, 1987; Scheers, 1986). Recent hoard discoveries at St Quentin, Northern France and

Leuze-en-Hainault, Belgium, show that Gallo-Belgic E in particular was a much more complex coinage than seemed likely only a dozen years ago, with distinctive sub-classes being struck—or issued—in a number of different regions (Huysecom et al., 1987; Scheers, 1986). Given the comparable explosion in the number of coin finds on the far side of the Channel, no attempt has been made to update the list of Continental provenances for the Gallo-Belgic A–F types contained in the previous gazetteers.

The impending publication in the *Proceedings of the Eleventh Oxford Symposium on Coinage and Monetary History* (Mays and Northover, forthcoming), of the metallurgical analyses undertaken by the British Museum Research Laboratory (Cowell et al., 1987) and by Northover at Oxford, promises to be of fundamental importance for our understanding of Iron Age coinage in Britain. The alloys of the Gallo-Belgic gold coinages follow a marked trend line (Cowell et al., 1987), and from the mid first century BC there was a general movement from silver-rich to copper-rich alloys (Kent, 1978). Suppostion that the later Durotrigian 'bronze' coinage was intially a precious metal issue of more refined appearance is reinforced by the high gold content of the earlier 'silver' issues (Cowell et al., 1987). British potin (strictly cast bronze) coins have been shown to be technologically the product of a long period of experimentation to find the most efficient manufacturing methods (Van Arsdell, 1986). A sample of the baked clay slab-moulds which are frequent finds on sites in coin-using areas have also been analysed (Tournaire et al., 1982), though Sellwood (1980) disputes their association with the production of coin blanks on technological grounds. New British finds come from Boxgrove, Sussex (Bedwin, 1983) and Puckeridge (Partridge, 1982).

The Chronology of Iron Age coinage in Britain

The absolute dating of the earliest Iron Age coinages on the Continent is still contentious, often hinging on dubious historical arguments or highly questionable assumptions of uniform weight loss and debasement through time. Coin production was probably episodic rather than continuous, especially early on (cf. Nash, 1987). A stepwise decline thus seems more likely, witnessed in the extreme case by the plunge which occurred during the Gallic war. On balance, the archaeological evidence suggests that the minting of Continental Iron Age gold and silver coinage began by the later third century BC at the latest (Kruta, 1982; Polenz, 1982), a dating which the coherence of the Greek prototypes they employ supports (Nash, 1987). However, the earliest coinages imported into Britain in any quantity are unlikely to be earlier than the mid second century BC.

The chronological development of the coinages first imported and later imitated in Britain can be divided into three principal periods, each of three phases (Haselgrove, 1987). The earliest significant Period I gold imports, Gallo-Belgic B and the earlier classes of Gallo-Belgic A probably belong to the later second century BC (Phase 1); these were followed towards the end of the century by the later ('post-Tayac') classes of Gallo-Belgic A (Phase 2). This was probably the period when the earliest British potins were produced; these and their derivatives were without doubt the earliest indigenous coinage on any scale, their early dating assured by their archaeological stratification (Haselgrove, 1988). During Phase 3 (of uncertain duration but probably equivalent to the first two decades of the first century BC) relatively

little gold was produced, even on the Continent where Gallo-Belgic A finally gave way to the earliest classes of Gallo-Belgic C (cf. Scheers, 1977). Kent's (1978) dating of the export of all three of these Gallo-Belgic gold types to Britain only shortly before the Gallic war is at variance with the hoard evidence and the Continental pattern (Haselgrove, 1987). Like the older 'invasion hypothesis' (Allen, 1960), his interesting suggestion that many Gallo-Belgic coins entered Britain to purchase mercenary support has probably been over-used. For the earlier imports, social and political relationships, and also ethnic ties, were probably more important factors.

Period II, commencing c. 80 BC, saw a new pattern established, with the import of the later Gallo-Belgic C classes 3–5 and Gallo-Belgic DC quarter staters (Phase 4). These were rapidly copied in Britain (e.g. British A, B, O), but the Le Catillon, Jersey hoard can no longer be used as a mid first century BC fixed point for these developments, quite as Allen (1960) did; it belongs to the latest Armorican hoard horizon (Gruel, 1986) and is probably slightly later (cf. Fitzpatrick and Megaw, 1987). Other British derivatives (e.g. British I, J) have features that link them to Gallo-Belgic E. this was the principal coinage of the Gallic war period, c. 60–50 BC, although contra Scheers (1977) its production probably commenced before the war (Haselgrove, 1987). Other Gallic war issues included Gallo-Belgic DB and DA, F and XC, and the earliest British types of British L and Q (Phase 5). The latter coinages, however, continued on into the post-war era, which also sees the introduction of silver and struck bronze (British LX, LY and LZ) and the first use of inscriptions (COMMIOS) (Phase 6, c. 50–20 BC; Note 4). It was towards the end of this phase, or soon after, that British potin production ceased (Haselgrove, 1988).

In Period III, the Augustan and Tiberian coins which British rulers often employed as prototypes for their own issues (Scheers, 1982) reinforce the historical framework already in place and supply much needed precision. From c. 20–10 BC, perhaps earlier, these Julio-Claudian emperors evidently recognised several British rulers as 'friendly kings' and allies: during Phase 7 (c. 20 BC–AD 10) Tincommios, Dubnovellaunus and Tasciovanus; in Phase 8 (c. AD 10–40) Verica, Cunobelinus and Eppillus. At the end of the sequence are the coinages of the last Southern rulers, Epaticcus and Caratacus, and a handful of types issued among the outlying tribes which could be post-Conquest strikings (Phase 9). Prasutagus—if the legend is correctly interpreted (Mossop, 1979)—is the only known client ruler of the period named on the coins.

Acknowledgements

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Notes

1. It is regrettably necessary to reiterate the principle caveats expressed in previous gazetteers. For many finds, the grid references given are only approximate, intended only for the compilation of small-scale distribution maps, either because some uncertainty exists over the exact findspot, or due to the lack of information. Other finds have been omitted altogether owing to doubts about the reliability of the provenance.

2. The excavation finds comprised 11 gold, 4 gold plated, over 350 silver and a few bronze. Many of the 48 unidentifiable bronze were probably also Iron Age types. 22 early Roman silver (the latest a plated denarius of Claudius I of AD 50–1, evidently not in fresh condition) were also recovered and 21 Roman bronze, mostly later issues (Surrey Archaeological Society, 1988).

3. As well as a photograph, the card for each coin records its weight, metallic composition, present location and pedigree, where these are known, together with the provenance and source of information. Enquiries should be made to the Secretary, Institute of Archaeology, 36 Beaumont Street, Oxford, OX1 2PG. Professor Cunliffe will be grateful to receive details of any fresh discoveries.

4. Prior to Period III, employing neutral terminology such as Allen's (1960), or a geographical nomenclature (Evans, 1864; Haselgrove, 1987), is to be preferred to attributing each coin type to a specific tribe as Van Arsdell (1989a) does. Such tribal attributions are likely to be anachronisitic, and increasingly so, the earlier the coinage. We have no definite evidence that the particular tribal units which the Romans adopted existed as coherent entities prior to the first century AD. These questions are discussed further in recent attempts to define Iron Age social and political boundaries, using coin distributions (Kimes et al., 1982; Sellwood, 1984b; Bradley, 1987).

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Phasing of British Iron Age coinage

All dates approximate to nearest + or - 10 years (after Haselgrove, 1987)

PHASE	DURATION	COMMENT
1	Mid/later 2nd century BC	Earliest systematic imports; Gallo–Belgic B and early A
2	Late 2nd century BC	Later Gallo-Belgic A gold; earliest British potins
3	Early 1st century BC	Latest Gallo-Belgic A and earlier C classes; phases of uncertain duration
4	c. 80–60 BC	Later Gallo-Belgic C classes and their earliest British derivatives; Gallo-Belgic Dc
5	c. 60–50 BC	Gallic war coinages and their immediate derivatives
6	c. 50–20 BC	Virtually no struck bronze; silver relatively limited; later British potins; legends very rare.
7	c. 20 BC–AD 10	Includes TASCIOVANVS legends, ADDEDOMAROS, DUBNOVELLAVNOS and TINCOMMIOS
8	c. AD 10–40	Includes CVNOBELINVS, subdivided into early (E) and late (L) issues, EPPILLVS and VERICA
9	c. AD 30–45	Includes EPATICCVS and CARA; some overlap with later Phase 8 issues

GAZETTEER

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
			GALLO-BELGIC A		
	Essex				
TQ 5993	Brentwood, near, 1982	1 AV¼	Series II	M of London	Found at depth of c. 11" after earthmoving
	Sussex				
TV 613980	Eastbourne, bef. 1984, on the beach	1 AV¼	Series II	*Sx. A.C.* 122, 217–8	
			GALLO-BELGIC B		
	Buckinghamshire				
SU 8394	West Wycombe, 1987	1 AV¼	BB2	Index	
	Essex				
TQ 6878	East Tilbury, 1980	1 AV¼	BB2	Shown B.M.	
	Kent				
TQ 4464	Farnborough, 1982	1 AV¼	BB2	Shown B.M.	Scheers 1977, Cl.II var. C
	London				
TQ 3788	Walthamstow, 1988 or bef.	1 AV¼	BB2	Shown B.M.	
			GALLO-BELGIC		
	Hampshire				
SU 3853	Hurstbourne Tarrant, bef.1985	3 AV	C	*Britannia* 17, 420	Scheers 1977, Cl.2; found together
	Kent				
TQ 7758	Boxley, 1984	1 Æ/AV	C?	*Archaeol. Cantiana* 101, 368	Plated stater perhaps copying Gallo-Belgic C. See also Uncertain
TQ 9573	Minster, Sheppey, 1978	1 AV	C	Shown B.M.	
TQ 7467	Rochester area, 1983 or bef.	1 AV	C	Shown B.M.	Scheers 1977, Cl.4-5
	Norfolk				
TG 1843	Runton, 1987	1 AV	C	Index	East or West Runton?
	Sussex				
TQ 4401	Newhaven, 1983 or bef., on the beach	1 AV	C	Shown B.M.	
			GALLO-BELGIC D		
	Bedfordshire				
TL 0045	Wootton, 1987	1 AV¼	DC	*B.N.J.* 57, 124	

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
	Dorset				
SZ 170908	Hengistbury Head, 1977	1 AV¼	DC	Cunliffe 1987, 136	
	Kent				
TQ 667485	East Peckham, 1987, Old Road, in a garden	1 AV¼	DC	Inf. D.B. Kelly; *Archaeol. Cantiana* 104, 355	
TR 1166	Whitstable, 1967, foreshore	1 AV¼	DC	Index	
	Norfolk				
TG 239041	Caistor St Edmund	1 AV¼	DC	Index	
	Somerset				
ST 6426	Cadbury area	1 Æ/AV¼	D	Index	
	Sussex				
TV 617987	Eastbourne, bef. 1984, on the beach	1 AV¼	DC	*Sx.A.C.* 122, 217	
			GALLO-BELGIC XC2		
	Sussex				
SZ 9399	Bognor, 1984 or bef.	1 AV¼	XC2	Index	
SZ 843933	Selsey, 1986, on the coast	1 AV¼	XC2	*B.N.J.* 56, 178–80	See also Verica, Epaticcus etc.
			GALLO-BELGIC E		
	Bedfordshire				
TL 0352	Clapham, 1987, in a field	2 AV	E	*Britannia* 19, 453	Scheers 1977, Cl.1 (1), Cl.2 (1). Found 40 m apart
	Cambridgeshire				
TL 2883	Bury, 1986, in a garden	6 AV in hoard	E	*B.N.J.* 57, 2–3	Scheers 1977, Cl.1–2
	Essex				
TQ 8585	Eastwood, bef. 1977, Eastwoodbury Lane	1 AV	E	*Seaby C.M.B.* 712, 425	
TQ 986924	Foulness, 1981–2, in River Roach	1 AV	E	Index	
TQ 8391	Hockley, bef. 1988, Hockley Woods	1 AV	E	Shown B.M.	Scheers 1977, Cl.2
TL 7012	Little Waltham, 1986	1 AV	E	*B.N.J.* 57, 124	
TQ 7590	North Benfleet, 1985	1 AV	E	*B.N.J.* 57, 124	Scheers 1977, Cl.4
TQ 884884	Southend-on-Sea, 1985, Temple Farm Industrial Estate	33 AV in hoard	E	*B.N.J.* 57, 2	Scheers 1977, Cl.1 (8 specimens), Cl.2 (16), Cl.3 (9). Found in association with sherds of wide-mouthed, shouldered bowl

	Hampshire				
SU 485526	Whitchurch, 1987, near Ridgeway Farm	34 *A* in hoard	E	*Britannia* 19, 477	Scheers 1977, Cl.2-4/5. Found in two clusters c. 55 m apart. See also British B
	Kent				
TQ 905503	Lenham, 1987-8	1 *A*	E	Inf. D.B. Kelly; *Archaeol. Cantiana* 105, 303	
TQ 4665	Orpington	1 *A*	E	*S.C.B.I. S.E. Museums* No. 37	
	London				
TQ 2463	Cheam, 1979 or bef.	1 *A*	E	Shown B.M.	
TQ 3178	Lambeth, bef. 1859	1 *A*	E	*Sy.A.C.* 2, 1859, 14–17	Not in Allen 1960 etc.
	Norfolk				
TG 239041	Caistor St Edmund, 1986, NE of Roman town	1 *A*	E	*Britannia* 18, 330	35 Roman coins (Otho – Valens) also found there
TG 240039	Caistor St Edmund, Police House Field	1 *A*	E	Index	Apparently a separate find
TG 3217	Hoveton	1 *A*	E	Index	
TF 8538	North Creake	1 *A*	E	*B.N.J.* 58, 140	See also Addedomaros
TG 246258	Skeyton, 1986	1 *A*	E	Index	
TF 598112	Wiggenhall St Mary Magdalen, 1985	1 *A*	E	*Britannia* 18, 331	Probably imported with garden soil
	Suffolk				
TL 8840	Great Cornard, 1970	1 *A*	E	*Proc. Suff. Inst. Archaeol. Hist.* 31(3), 318–30	
TM 1244	Sproughton	1 *A*	E	*Proc. Suff. Inst. Archaeol. Hist.* 32(2), 205–14	
	Surrey				
SU 8446	Farnham, bef. 1859, Castle	1 *A*	E	*Sy.A.C.* 2 (1859), 14–7	Not in Allen 1960 and incorrectly listed under British A by Haselgrove 1984, 115. An early stray from the hoard found in Farnham Park in 1980 (ibid., 114)?
TQ 0049	Guildford, 1986	1 *A*	E	*B.N.J.* 57, 124	
	Sussex				
TQ 074200	Pulborough, near, 1976	1 *A*	E	*Sx.A.C.* 117, 251	
TQ 1105	Worthing, 1976 or bef., Durrington	1 *A*	E	*S.C.B.I. S.E. Museums* No. 60	Scheers Cl.1 or even Gallo-Belgic C Cl.4. Could conceivably repeat Haselgrove 1978, 10

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
	Warwickshire				
SP 4161	Southam, c. 1900	1 *A*	E?	Inf. L. Sellwood	*Bagendon* p.136, but not in Allen 1960. Described as Gallo-Belgic Plain, but conceivably British?
	Wiltshire				
SU 2675	Aldbourne, near, Woodsend	1 *A*	E	Index	Settlement
Correction:	The coin listed as found at Lower Malling, Kent (Haselgrove 1978, 18) was actually found at Addington, Kent (Stukeley 1720, Notebook, Ms CCCC613) and may be linked with other finds from there.				
			BRITISH A		
	Buckinghamshire				
SU 8394	West Wycombe, 1982	2 *A*	A1	Index	See also Addedomaros, Cunobelinus. Coins found 'at bottom of slope'
	Dorset				
SY 9782	Corfe Common, 1980, Town's End	1 *A* in hoard	A1	*B.N.J.* 57, 8–9	See also Durotriges
	Suffolk				
TL 8850	Alpheton, 1987	1 *A*	A1	*B.N.J.* 57, 125	
Correction:	Delete Farnham (1859) 1 *A* British A (Haselgrove 1984, 115); the coin is Gallo-Belgic E (q.v.)				
			BRITISH B		
	Dorset				
ST 9502	Shapwick, 1983, Badbury Rings	1 *A* in hoard?	B	Index	See also Durotriges etc. Recorded with other coins almost certainly from the hoard, but see Van Arsdell 1989b
	Hampshire				
SU 318100	Ashurst, 1987, in field near Ironshill	19 *A* in hoard	B	*B.N.J.* 57, 6–7	Pit with charcoal layer at base found nearby
SU 4518	Eastleigh, 1969, Shakespeare Road	1 *A*	B	*S.C.B.I. S.E. Museums* No. 78	
SU 3237	Nether Wallop, 1984, Danebury Hill	1 Æ/*A*	B	Inf. A. Burnett	Found with other coins
SU 485526	Whitchurch, 1987, near Ridgeway Farm	108 *A* in hoard	B	*Britannia* 19, 477	Found in two clusters c. 55 m apart. See also Gallo-Belgic E
	Sussex				
SZ 8593	Selsey, 1979	1 *A*	B	Index	

	Wiltshire				
SU 318523	Chute, 1986, Chute Forest	55 *AV* in hoard	B	*B.N.J.* 57, 5–6	Mostly struck from same dies as original hoard (Allen 1960, 177) from here, but clearly a separate deposit
SU 1354	Upavon	1 *AV*	B	Index	Found with Gaulish potin
			BRITISH D		
	Hampshire				
SU 5929	Cheriton, 1982–3	27 *AV* in hoard	D var.	B.M.	Hoard partly registered in Haselgrove 1984, 115. Supplementary information on provenance from finder, correcting Haselgrove 1987, 276, No. 17
	Cheriton, 1986	4 *AV*	D var.	*Britannia* 18, 347; 19, 476	Further finds from the hoard
	Cheriton, 1987	2 *AV*	D var.		
			BRITISH G		
	Essex				
TL 8618	Kelvedon, in the 1980's	1 *AV*	G	Index	
	Norfolk				
TM 227931	Topcroft	1 *Æ/AV*	G	Index	
	Suffolk				
TM 4274	Thornington	1 *AV*	G	Index	
			BRITISH H		
	Cambridgeshire				
TL 5078	Witchford, 1980	1 *Æ/AV*	HB	Shown B.M.	
	Essex				
TQ 773928	Wickford, 1986 or bef.	1 *AV*	HA	Index	Cf. also British IC
	Northamptonshire				
SP 7546	Grafton Regis	1 *Æ/AV*	H	Shown B.M. 1980	
			BRITISH I		
	Humberside				
TA 2810	Grimsby, 1984	1 *AV*	IC	Index	Possibly more coins from here
SE 9826	North Ferriby, 1979	1 *AV*	I var.	Inf. P. Didsbury	Wheel in front of horse, triscale beneath

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
	Kent				
TQ 7550	Linton, bef. 1895, 'below the hill'	1 *AV*	IC	*Archaeol. Cantiana* 21, li	Not in Allen 1960 etc. As Evans 1864, A11
	Lincolnshire				
SK 8594	Blyton	1 *AV*	I	Index	
	Northamptonshire				
TF 1703	Wernington	1*AV*	IC	*B.N.J.* 58, 146	
	Warwickshire				
SP 161812	Solihull, c. 1980–1, in garden in Foredrove Lane	1 *AV*	IC	Index	
			BRITISH J		
	Cambridgeshire				
TL 4857	Cherry Hinton	1 *AV*	JB	Index	
	Norfolk				
TL 941840	Brettenham	3–4 *AV*	JB	Index	Cf. Haselgrove 1984, 116
TG 3709	Burlingham	1 *AV*	JB	Index	
TF 808032	Cockley Cley	1 Æ/*AV*	J	Index	Cf. Haselgrove 1984, 116. Analysed B.M.
TG 103313	Corpusty, 1986	1 *AV*	JB	Index	
TG 187055	Cringleford, 1986	1 *AV*	JB	Index	
TL 7288	Hockwold-cum-Wilton, 1985	1 Æ/*AV*	JB	Index	
TF 753019	Oxborough, 1984	1 Æ/*AV*	JA	Index	
TM 0291	Quidenham	1 *AV*	J	Index	
TF 7333	Snettisham, 1987, in field beside Bircham Road (i)	26 *AV* in hoard	JB	B.M.; *Britannia* 19, 456	See also British L, LX gold, N etc. A second lot found here in 1988 (below)
TF 7333	Snettisham, 1988, in field beside Bircham road (ii)	17 *AV* in hoard	JB	B.M.	A second lot, of similar composition to 1987 hoard
TG 184432	West Runton	1 *AV*	J	Index	Repeats Haselgrove 1987, 26?
TG 089040	Wicklewood, Crownthorpe	1 *AV*	JB	Index	See British LX gold
	Suffolk				
TM 3066	Badingham, 1982	1 *AR*	J?	*Proc. Suff. Inst. Archaeol. Hist.* 35(3), 229	Possible forgery? Obv: wolf or boar left; Rev: plain
TM 2037	Chelmondiston, 1987	1 Æ/*AV*	J	*Proc. Suff. Inst. Archaeol. Hist.* 36(4), 309	

TM 1152	Coddenham, 1980, Baylham House	1 Æ/*A*	JB	*Proc. Suff. Inst. Archaeol.*	Apparently distinct coins
		1 *A*	JB	*Hist.* 35(1), 74; Index	
TL 9370	Ixworth, 1987	1 Æ/*A*	J	*Proc. Suff. Inst. Archaeol. Hist.* 36(4), 310	
TL 9680	Knettishall, 1987	1 *A*	J	*Proc. Suff. Inst. Archaeol. Hist* 36(4), 310	Pale gold; Roman coins from site
TL 7074	Mildenhall, Back Row	1 Æ/*A*	JB	Index	
TM 0578	Redgrave, 1983	1 *A*	JB	*Proc. Suff. Inst. Archaeol. Hist.* 35(4), 325	
	Cambridgeshire		BRITISH K		
TL 1999	Peterborough	1 Æ/*A*	KM	Shown B.M. 1983	
SU 639624	Silchester, 1985–6, Forum Basilica	2 Æ/*A*	KO	Inf. M. Fulford; Boon forthcoming	Excavations
SE 9426	Brough on Humber, 1978, Cave Road	1 *A*	KM	Shown B.M.; East Riding Archaeol. Soc.	
TA 2810	Grimsby, 1979, Chelmsford Ave	1 *A*	KN	*Lincs. Hist. Archaeol.* 15, 90–1	
TA 2810	Grimsby, 1979	1 *A*	KO	Shown B.M.	Repeats preceding?
SE 9826	North Ferriby, 1979	1 *A*	KO	Inf. P. Didsbury	
	North Ferriby, 1980	1 Æ/*A*	KL		
	North Ferriby, –	1 *A*	KL		
	Lincolnshire				
TF 206896	Ludford Magna, 1979	1 *A*	K, type uncertain	*Lincs. Hist. Archaeol.* 15, 67	
TF 575636	Skegness	1 *A*	KO	Shown B.M.	
	Northamptonshire				
SK 6333	Clipston on the Wolds	1 *A*	KP	*B.N.J.* 58, 147	
	Warwickshire				
SK 2600	Dordon, 1986	1 *A*	KO	*B.N.J.* 58, 147	
SP 447818	Stretton under Fosse, 1983	1 *A*	KM	Inf. L. Sellwood	
	Wiltshire				
ST 8787	Easton Grey, 1985	1 *A*	KM	*W.A.M.* 81, 141	
	South Yorkshire				
SE 499024	Barnburgh	1 *A*	KN	Shown B.M.	
SE 534165	Kirksmeaton	1 Æ/*A*	Cf. KO	Shown B.M.	Obv: nearer M457?

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
			BRITISH L		
	Dorset				
SZ 170908	Hengistbury Head, 1977	1 *AV*	L	Cunliffe, 1987, 136–41	
	Essex				
TL 7006	Chelmsford, near, Sainthill	1 *AV*	LB	*B.N.J.* 57, 125	
TL 471125	Harlow, 1985–7, Harlow Temple	3 *AV*¼	LB (M73A)	Inf. R. Bartlett	Excavations
TQ 675885	Laindon, 1985	1 *AV*	LB	Index	
TQ 7999	Woodham Ferrers	1 *AV*	L new var.	Shown B.M.	Cf. British LB, LC
	Hampshire				
SU 724029	Hayling Island, 1981, Temple	1 *Æ/AV*	LB	Inf. D. Nash	Excavations
	Norfolk				
TF 7333	Snettisham, 1987, field beside Bircham road (i)	8 *AV* in hoard	LB	B.M.; *Britannia* 19, 456	See also British J, LX gold, N etc.
TF 7333	Snettisham, 1988, field beside Bircham road (ii)	14 *AV* in hoard	LB	B.M.	See also British J
			BRITISH LX – gold		
	Cambridgeshire				
TL 4658	Cambridge area, 1982	1 *AV*¼	LX2-3	Shown B.M.	
	Essex				
TM 0025	Colchester area	1 *AV*¼	LX 3 var.	Shown B.M.	
TL 471125	Harlow, 1985–7, Temple	1 *AV*¼	LX2	Inf. R. Bartlett	Excavations
		1 *AV*¼	LX4 var.		Rev: M70
		2 *AV*¼	LX4		
TL 7715	Terling, 1987 or bef.	1 *Æ/AV*¼	LX new type	Shown B.M. 1987	Rev: horse. Cf. M46
TL 8114	Witham	1 *AV*¼	LX new type	Shown B.M.	Obv: pattern. Rev: horse right
	Kent				
TQ 779512	Boughton Monchelsea, 1987–8, Brishing	1 *AV*¼	LX1	Inf. D.B. Kelly; *Archaeol. Cantiana* 105, 303	
	Norfolk				
TG 3709	Burlingham	1 *AV*¼	LX4	Index	
TM 348902	Ditchingham, 1984	2 *AV*¼	LX4	Index	
TF 7333	Snettisham, 1987, field beside Bircham road (i)	3 *AV*¼	LX4 var.	B.M.; *Britannia* 19, 456	Types cf. M74/6. See also British J, L, N etc.
TF 7333	Snettisham, 1988, field beside Bircham road (ii)	7 *AV*¼	LX4 var.	B.M.	See also British J etc.

TG 089040	Wicklewood, Crownthorpe	1 AV¼	LX4	Index	See British J
			BRITISH LX – Silver		
	Bedfordshire				
TL 1343	Old Warden, 1984–5	1-2 AR	LX8	Index	
	Cambridgeshire				
TL 5078	Witchford, 1980	1 AR	LX10	Shown B.M.	
	Essex				
TL 755229	Braintree, 1981–3, Fountain Hotel	1 AR	LX17	*Britannia* 15, 307	Excavations
TL 471125	Harlow, 1985–7, Temple	1 AR	LX9	Inf. R. Bartlett	Excavations
		1 AR	LX15		
		1 AR	LX new type		Silver version of LX 21–2
		2 AR	LX new type		Silver version of LX 24
	Hampshire				
SU 724029	Hayling Island, 1982, Temple	1 AE/AR	LX15 var.	Inf. D. Nash	Cf. LX 15, but reversed as Haselgrove 1984, 118
	Hertfordshire				
TL 250338	Baldock, 1982, Walls Field	1 AR	LX14	Inf. G. Burleigh	Excavations
TL 389238	Puckeridge, 1983 or bef., opposite Smiths	1 AR	LX14	Index	
	Kent				
TQ 4665	Orpington	1 AR	LX10?	Shown B.M.	Excavations
	Leicestershire				
SK 582045	Leicester, 1939, Jewry Wall	1 AR	LX8	Inf. A. Fitzpatrick	Previously incorrectly identified as Gaulish (Allen, 1960, 282)
	Norfolk				
TG 371085	Burlingham	1 AR	LX10B	Index	Another coin Haselgrove 1984, 119
TG 239038	Caistor St Edmund, 1985	1 AR	LX10C	Index	
TG 171094	Costessey, 1985	1 AR	LX10C	Index	
TG 153069	Long Melton	1 AR¼	LX10C	Index	
TM 023895	Quiddenham	1 AR	LX10	Index	
TF 887003	Saham Toney, Woodcock Hall	1 AR	New type	*Britannia* 17, 51–3	Types as LX24
TQ 089040	Wicklewood, Crownthorpe	5 AR	LX10A	Index	
		7 AR	LX10B		
		1 AR	Cf. LX8		
	Suffolk				
TL 8564	Bury St Edmunds	1 AR	New type	Index	

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
TM 510912	Carlton Colville, 1985	1 Æ	LX10A	*Proc. Suff. Inst. Archaeol. Hist.* 36(2), 141	
TM 3059	Hacheston	1 Æ	LX10 var.	Index	
TM 308591	Hacheston, 1973–5	2 Æ½	New type	*N.C.* (ser. 7) 18, 177	Obv: uncertain design. Rev: horse right. Same type as Allen 1960, 269. Excavations
TM 2349	Hasketon, 1984	1 Æ	LX10	*Proc. Suff. Inst. Archaeol. Hist.* 36(1), 44	
TL 7670	Lackford, 1978	1 Æ	LX10	*Proc. Suff. Inst. Archaeol. Hist.* 24(3), 215	Same find as Icklingham (Haselgrove 1984, 119)?
TL 9673	Stanton, 1978	1 Æ	LX10	Shown B.M.	

BRITISH LX – Bronze

	Bedfordshire				
TL 1633	Holywell, bef. 1890	1 Æ	LX21–22	*Proc. Camb. Antiq. Soc.* 7 (NS 1), 152–6	Not in Allen 1960
	Cambridgeshire				
TL 6443	Ashdon, near, 1983, Castle Camps	1 Æ	LX22	Index	
	Essex				
TL 755229	Braintree, 1981–3, Fountain Hotel	1 Æ	LX22	*Britannia* 10, 307	Excavations
TQ 6878	East Tilbury, 1979	1 Æ	LX new type	Shown B.M.	Obv: confronted animals, rouelle, apparently same series as Claydon etc.
TL 471125	Harlow, 1985–7, Temple	3 Æ	LX21	Inf. R. Bartlett	Excavations
		4 Æ	LX22		
		5 Æ	LX23		
		1 Æ	LX24		
	Hampshire				
SU 639624	Silchester, 1979–84, Forum Basilica	1 Æ	LX23	Boon 1985, No. 29.	Excavations.
		1 Æ	Cf. LX21	Inf. M. Fulford; Boon No. 36 & forthcoming	Large variant
	Hertfordshire				
TL 244337	Baldock, 1979, Park Street	1 Æ	LX22	Stead and Rigby 1986, 90–1	
TL 251340	Baldock, 1980–7,	3 Æ	LX21	Inf. G. Burleigh	Excavations
	Upper Walls Common	1 Æ	LX22		
TL 250338	Baldock, 1987, Walls Field	1 Æ	LX23		

TL 387236	Braughing, 1971–2, Ermine Street	2 Æ	LX23	*Herts. Archaeol.* 10, 28–9	For the 1971 coins from this excavation, see Haselgrove 1978, 46
TL 391238	Braughing, 1983 or bef., Gatesbury	1 Æ	LX new type	Index	Obv: confronted animals, one a boar, with rouelle between. Rev: horse right. Probably same type as Claydon and Hacheston coins; but also cf. Belgic Gaul, e.g. Scheers No. 87
TL 389238	Puckeridge, 1983 or bef., opposite Smiths	2 Æ	LX24	Index	
		1 Æ	LX24 var?		
		1 Æ	LX23		
		1 Æ	LX21		
	Puckeridge, Roundabout	6 Æ	LX22		
		7 Æ	LX22 var.		
		1 Æ	LX24 var.		
		1 Æ	LX new type	Index	Obv: confronted animals?, circle between. Rev: horse right. Similar to type from Gatesbury, Claydon etc., but also cf. Belgic Gaul, e.g. Scheers No. 91
TL 117079	St Albans, 1975, Gorhambury	1 Æ	Cf. LX24 etc.	Neal et al., 1990, 110, No. 4	Excavations
	Kent				
TQ 7376	Cliffe, Wharf Farm	1 Æ	LX22	Index	
	Norfolk				
TM 400988	Norton-sub-Course, 1984	1 Æ in hoard	New type	Index	See also Iceni. Same type as Claydon and Hacheston. Hoard also contained Roman denarii to Claudius
	Northamptonshire				
SP 647600	Flore, 1983, Kings Lane	1 Æ	LX22 var.	*Northants. Archaeol.* 20 147–8	
TL 006794	Titchmarsh, 1984, Springfield	2 Æ	LX21–22	*Northants. Archaeol.* 20 147–8	
		1 Æ	LX 23		
	Suffolk				
TM 128492	Claydon, 1975, Papermill Lane	2 Æ	LX new type = Evans 1864, 120	*Proc. Suff. Inst. Archaeol. Hist.* 33(2), 213–4	Excavations. Same type as the coins from Brettenham, Nf. (Allen 1960, 277), and Hacheston Sf.
TM 1150	Great Blakenham, 1983, 1986	1–2 Æ	LX new type?	*Proc. Suff. Inst. Archaeol. Hist* 35(4), 321; ibid. 36(2), 140	Cf. LX new type from Claydon etc.? 1986 coin may repeat and need not be this type

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
TM 313568	Hacheston, 1974	1 Æ	LX new type = Evans 1864, 120	*Proc. Suff. Inst. Archaeol. Hist.* 33(2), 216–7	R-B site. Same type as the coins from Brettenham, Nf. and Claydon, Sf., which seems to place it in the South-Eastern tradition
TL 931698	Packenham, 1985, Ixworth fort	1 Æ or *Æ*	Cf. LX21?	*Britannia* 18, 332	
			BRITISH LY – Silver		
	Hampshire				
SU 724029	Hayling Island, 1982, Temple	1 Æ/*Æ*	New type?	Inf. D. Nash	Rev: radiate pattern, close to M316D
	Kent				
TR 146576	Canterbury, 1986, Stour Street	1 Æ/*Æ*	New type	Noted by author	Obv: head cf. M274A? Rev: galloping horse left, cf. 298. Excavations
			BRITISH LY – Bronze		
	Essex				
TL 471125	Harlow, 1985–7, Temple	1 Æ	LY – (M316D)	Inf. R. Bartlett	Excavations
	Kent				
TR 146576	Canterbury, 1987, Castle Street	1 Æ	LY8	Noted by author	Excavations
TQ 612727	Springhead, 1986 or bef.	1 Æ	LY6	Index	
TR 0546	Wye	1 Æ	LY7	Index	
			BRITISH LZ – Gold		
	Surrey				
SU 902495	Wanborough, 1983–6, Green Lane	7 *AV*¼	LZ6	Inf. J.P.C. Kent	See Epatticus
			BRITISH LZ – Silver		
	Hampshire				
SU 724029	Hayling Island, 1981, Temple	1 Æ/*Æ*	cf. LZ8	Inf. D. Nash	Excavations. Rev: inscribed EX
	Hayling Island, 1978	1 *Æ*	cf. LZ8		Haselgrove 1984, 153, as Uncertain
	Hayling Island, 1977, 1981	2 Æ/*Æ*½	cf. LZ8		One Haselgrove 1984, 141, as 'Dobunnic Irregular'
	Hayling Island, 1982	1 Æ/*Æ*	LZ new type		Surface find. Obv: head left. Rev: horse left. Similar to preceding
SU 327376	Nether Wallop, 1984, Danebury	7 *Æ*	LZ new type	Inf. A. Burnett	See also British O, Q, Tincommius, Verica, Epaticcus etc. Some but not all of these coins may originally
		2 *Æ*	LZ new type		
		3 *Æ*	LZ new type		

		2 Æ	LZ new type		have formed part of a hoard; they were found just outside the Iron Age hillfort
		1 Æ	LZ8		
		2 Æ	LZ8 var.		
		12 Æ	LZ new types		
		1 Æ¼	LZ new type		
		2 Æ	LZ new types		
		1 Æ/Æ	LZ new type		
SU 639624	Silchester, 1979–84, Forum Basilica	1 Æ	LZ new type	Boon 1985, No.9	Obv: boar left. Rev: cf. M88 Type is present in Danebury find
	Silchester, 1985–6	1 Æ/Æ	LZ new type	Inf. M. Fulford; Boon forthcoming	Obv: eagle. Rev: triple-tailed horse
SZ 6399	Portsmouth, 1830	1 Æ in hoard	LZ new type	*B.N.J.* 50, 1–6	Type as Hayling Island (Haselgrove 1984, 120). See also Armorican and Uncertain.
	Oxfordshire				
SP 3509	Witney	1 Æ	LZ new type	*B.N.J.* 57, 126	Obv: confronted beasts. A similar coin was found at Danebury
	Surrey				
SU 902495	Wanborough, 1983–6, Green Lane	18 Æ	LZ8	Inf. J.P.C. Kent	See also Epaticcus etc.
		15 Æ	Cf. LZ8		Inscribed EX on Rev.
	Sussex				
SZ 843933	Selsey, 1986, on the coast	4 Æ in hoard	LZ8	*B.N.J.* 56, 178–80	See also Verica, Epaticcus etc.
			BRITISH MB		
	Berkshire				
SU 7272	Reading area, 1983 or bef.	1 Æ	MB	Shown B.M.; *Oxford J. Archaeol.* 4, 242	
ST 9705	Witchampton, 1980, Bradford Farm	1 Æ	MB	B.M.; *W.A.M.* 76, 85	Distinct from Hengistbury coin (Haselgrove 1984, 120)?
	Wiltshire				
SU 217619	Mildenhall, 1978, Chopping Knife Lane	1 Æ	MB	*W.A.M.* 76, 85	See Haselgrove 1984, 120 for another coin from near here
SU 2771	Ramsbury, 1985	1 Æ	MB	*W.A.M.* 81, 141	
SU 2162	Savernake (?), 1985 or bef.	1 Æ/Æ	MB var.	*Oxford J. Archaeol.* 4, 241–44	Obv: Dobunnic branched emblem. Rev: M62. Believed to come from here
SU 143552	Upavon, 1980, Upavon Hill	1 Æ	MB	*W.A.M.* 76, 176	Also Roman finds from site

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
			BRITISH N		
	Cambridgeshire				
TL 4857	Cherry Hinton	3 *AV*¼	ND	Index	One not certainly this type
	Humberside				
SE 9826	North Ferriby, 1981	1 *AV*	NA	Index	
SE 9820	South Ferriby, under the cliffs	1 *AV*	NA	Index	
	Norfolk				
TL 9383	Brettenham, 1985	1 *AV*	NA	Index	
TG 235033	Caistor St Edmund	1 *AV*¼	ND	Index	
TM 123915	Carleton Rode, 1985, Hargate	1 *AV*¼	ND	Index	
TM 3490	Ditchingham, c. 1984	2 *AV*¼	ND	Index	Found 700 m apart
TF 7333	Snettisham, 1987, field beside Bircham road (i)	2 *AV*	New type 1	B.M.; 19, 456	Obv: die defaced
		3 *AV* in hoard	New type 2		Obv: cross of dots, stars, cf. Freckenham type A; possibly over defaced die. See also British J etc.
TF 7333	Snettisham, 1988, in field beside Bircham road (ii)	1 *AV*	New type 1	B.M.	See also British J etc.
		1 *AV* in hoard	New type 2		
TL 8783	Thetford	1 *Æ/AV*	NA	Index	
TG 0803	Wicklewood, Crownthorpe	1 *AV*	NC	Index	
		1 *AV*¼	ND		
	Suffolk				
TL 7074	Mildenhall, Back Row	2 *AV*	NA	Index	
			BRITISH O		
	Dorset				
SP 9602	Badbury Rings, near	1 *AV*¼	O (M40)	Index	A hoard coin?
ST 8511	Blandford Forum near, 1982, between Hod Hill and Hambledon Hill	1 *AV*¼	O	Index	
SZ 170908	Hengistbury Head, c. 1979	4 *AV*¼	O	Cunliffe 1987, 136–41	
ST 9603	Shapwick, 1983, Badbury Rings	3 *AV*¼	O (M44)	Index	See also Durotriges etc.
		2 *AV*¼ in hoard	O? (M44?)		Or *ÆR*¼ M319
ST 9502	Shapwick, 1983, Crab Farm	5 *AV*¼	O (M44)	Index	
		2 *AV*¼ in hoard	O? (M44?)		Or *ÆR*¼ M 319

ST 9502	Shapwick, 1983, Shapwick/Badbury Rings	7 *AV*¼ in hoard	O (M44)	Index	
	Hampshire				
SU 5929	Cheriton, 1982–3	3 *AV*¼ in hoard	O	B.M.	See also British D, correcting Haselgrove 1987, 276
	Cheriton, 1987	1 *AV*¼	O	*Britannia* 19, 476	Further coin from hoard
SU 724029	Hayling Island, 1981, Temple	1 *AV*¼	O (M40)	Inf. D. Nash	Excavations
		1 *Æ*/*AV*¼	O?		Or Gallo-Belgic D?
SU 3237	Nether Wallop, 1984, Danebury Hill	5 *AV*¼	O (M40)	Inf. A. Burnett	See also British LZ, Q,
		2 *AV*¼	O	Index	Tincommius, Verica etc.
	Kent		BRITISH P		
TQ 882697	Iwade, 1984 or bef., Chetney Hill foreshore	1 *AV*¼	PA	*Archaeol. Cantiana* 101, 370	
	Surrey				
TQ 232414	Charlwood	1 *AV*¼	PB	*B.N.J.* 57, 125	
	Berkshire		BRITISH Q		
SU 5276	Hampstead Norreys, 1979, near the village	3 *AV*	QB	Newbury Mus.	Found together
	Buckinghamshire				
SP 839427	Stanton Low	1 *AV*¼	QC (M70)	Inf. C. Johnson	
	Dorset				
ST 9502	Shapwick, 1983, Shapwick/Badbury Rings	1*Æ*/*AV* in hoard?	Q	Index	See also Durotriges uninscribed etc. Recorded with other hoard coins, but not in Van Arsdell 1989b
	Essex				
TL 7006	Chelmsford, 1986	1 *AV*¼	QC	*B.N.J.* 57, 125	
TL 471125	Harlow, 1985–7, Temple	1 *Æ*/*AV*¼	QC	Inf. R. Bartlett	Excavations
	Hampshire				
SU 3853	Hurstbourne Tarrant, 1984 or bef., Rag Wood	1 *AV*	QA	Index	Found together. From a molehill.
		1 *AV*¼	QC var.		Claudian copy found c. 30 m away
	Hurstbourne Tarrant, 1986	1 *AV*	QA	*B.N.J.* 58, 141	Apparently distinct
SU 5258	Kingsclere, 1986, Sandford Farm	7 *AV* in hoard	QB	*Britannia* 19, 476	Found in hollow flint tube blocked at ends with clay
SU 327376	Nether Wallop, 1984, Danebury Hill	1 *AV*¼	QC new types	Inf. A. Burnett	Or LZ? South coast types

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
		1 Æ/A¼			
		1 Æ/A¼		Index	
SU 4829	Winchester, 1984, St Catherine's Hill	1 A¼	QC new type	Index	Or LZ
	Surrey				
SU 902495	Wanborough, 1983–6, Green Lane	1 A	QA	Inf. J.P.C. Kent	See also Epaticcus etc.
		1 Æ/A	QA		
	Warwickshire				
SP 089572	Alcester, 1975, Lloyd's Bank Site	1 Æ/A	QB?	Warwick Mus; *B.N.J.* 58, 140	Excavations. Or Gallo-Belgic E?
SP 431764	Wolston, 1987, Vicarage Barn	1 A	QB	*W. Midlands Archaeol.* 30, 56–7	
	Wiltshire				
SU 120771	Broad Hinton, 1981, Weir Farm	1 A¼	QC	*W.A.M.* 80, 158	M74 var. This is one of the coin types ascribed to Wiltshire in B.N.J. 47, 11 ff.
SU 2966	Little Bedwyn, 1984, W of Chisbury Camp	1 A¼	QC?	*W.A.M.* 80, 242	Perhaps M67
SU 1354	Upavon, 1988	1 A¼	QC	Index	Cf. M66–7
Continental	*France:*				
	Eu, Seine Maritime, 1974–8, Bois l'Abbé	2 A	QA	*Traité de Numismatique Celtique* III	Excavations
			BRITISH R		
	Herefordshire				
SO 645239	Weston-under-Penyard, 1968, Ariconium	1 A¼	RB	*Trans. Woolhope Nat. Field Club* 39.2, 367	
			BRITISH POTIN		
	Berkshire				
SU 8985	Cookham, 1958–9, Prior's gravel pit	2 potin	Cl.I or II	*Archaeol. Newsletter* 6(12), 284	Not in Allen 1960. Site produced 'Belgic' pottery
SU 5766	Woolhampton, 1987 or bef.	1 potin	F	Index	
	Buckinghamshire				
SP 8213	Aylesbury, 1987, Watermead	1 potin	Early British type	Index	Or Central Gaulish import?

	Cambridgeshire				
TL 5866	Burwell	1 potin	F	Index	
TL 2470	Godmanchester area, 1986	1 potin	P	Index	
	Dorset				
SY 669885	Maiden Castle, 1986	1 potin	Early British type	Inf. N. Sharples	Excavations. Or Central Gaulish import?
	Essex				
TL 755229	Braintree, 1981–3, Fountain Hotel	1 potin	O2	*Britannia* 15, 307	Excavations
TQ 6878	East Tilbury	3 potin	Cl.I	Shown B.M.	Other coins found here
TQ 4586	Ilford, 1987, Uphall Camp	2 potin	L	Inf. P. Greenwood	Excavations
		1 potin	Cl.I?		
TL 505428	Great Chesterford, 1986, Churchyard	1 potin	Cl.I?	*Proc. Camb. Antiq. Soc.* 77 (1988), 115	Excavations
TQ 598798	North Stifford, 1980, Ardale School	1 potin	O–P	Inf. A. Wilkinson	Excavations
TQ 610804	Stifford Cleys, 1980	1 potin	Cl.I	Inf. A. Wilkinson	Excavations. Fragmentary, possibly F–G
TL 551232	Takely, 1987, Stanstead Airport Catering site	51 potin in hoard	M	Inf. H. Brooks	Excavations; some almost types N–O
		1 potin	L		Not hoard coins
		2 potin	M		
		1 potin	O		
TQ 7183	Thurrock, 1987, Corringham	c. 2000 potin in hoard	Early British types	Inf. A. Fitzpatrick	Some coins are quite close to Central Gaulish types, and could be Continental imports. Others are closerto Type A
	Hertfordshire				
TL 250338	Baldock, 1987, Walls Field	1 potin	Cl.II	Inf. G. Burleigh	Excavations
TL 387236	Braughing, 1972, Ermine Street	1 potin	P	*Herts. Archaeol.* 10, 28–9	For the 1971 finds from this excavation, see Haselgrove 1978, 46
TL 391238	Braughing, 1983 or bef., Gatesbury	2 potin	P	Index	
TL 2132	Letchworth, 1981 or bef., Wilbury Allotments	1 potin	L	*S.C.B.I. S.E. Museums* No. 151	
TL 389238	Puckeridge, 1983 or bef., opposite Smiths	1 potin	P	Index	
	Kent				
TQ 734585	Aylesford, 1985, in R.Medway	1 potin	F	*Archaeol. Cantiana* 102, 266–7	Found near N bank, opposite Little Preston
TQ 755604	Boxley, 1981, in woodland N of White Horse Stone	1 potin	Early British type	*Archaeol. Cantiana* 101, 367–8	

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
TQ 786593	Boxley, 1983, The Warren	1 potin in hoard	Cl.I		Additional coin from the hoard (Haselgrove 1984, 123)
TQ 758587	Boxley, 1984	1 potin	H		
TQ 769582	Boxley, 1984	1 potin	GB		
TQ 779594	Boxley, –	2 potin	A	Index; *Archaeol. Cantiana* 101, 368	See Haselgrove 1984, 123 for other potins from here
		1 potin	L		
TR 148576	Canterbury, 1982, Marlowe Theatre	1 potin	M	Index	Excavations
		1 potin	Cl.I?		
		1 potin	Cl.II		
TR 147575	Canterbury, 1986, St John's Lane	2 potin	L, O	Noted by author	Excavations
TQ 7376	Cliffe, 1979	5 potin	F-G (1) G (1), L (2) Cl.I (1)	Noted by author	Excavations
TQ 5467	Farningham, 1947, Oliver Crescent	1 potin	Cl.I or II	*Archaeol. Cantiana* 61, 180–3	Not in Allen 1960
TQ 5566	Farningham, 1975, Farningham Hill	1 potin	L	B. Philp Excavations in the Darenth Valley	A second coin of the type from here
TR 193369	Folkestone, 1948, Cheriton, E of cemetery	1 potin	Cl.I or II	*Archaeol. Cantiana* 62, 21–36	Not in Allen 1960
TQ 9065	Milton Regis	2 potin	P	*Archaeol. Cantiana* 105, 305	Found during sorting of Roman coins in Maidstone Museum
TR 178371	Newington, 1988 or bef., Dollands Moor	1 potin	Early British type	Inf. P. Garrard	Or Central Gaulish import? Typologically earlier than type A
TQ 686644	Upper Halling, 1984	1 potin	Early British type	*Archaeol. Cantiana* 102, 272–3	Cf. Boxley coin
TR 0546	Wye, 1986–7	3 potin	Early British type	Index	Or Central Gaulish?
		1 potin	F		
	London				
TQ 297658	Beddington, 1951–2, Sewage Farm Roman Villa	1 potin	P	Index	Excavations
TQ 221781	Chiswick, c. 1980, NE of Chiswick Eyot	1 potin	L	Index	See also Gaulish bronze. Other coins reported from here
TQ 331806	London, 1985, Billingsgate Lorry Park	1 potin	GB	Index	Found on spoil tip

TQ 387636	New Addington, 1978, Castle Hill Ruffs	20 potin in scattered hoard	M, N, O, P	*Bull. Sy. Archaeol. Soc.* 159. Inf. A. Fitzpatrick	Includes Haselgrove 1984, 124 (3 potins); pottery also found
TQ 2274	Putney, 1983 or bef., near the Thames	1 potin	A	*Spink Num. Circ.* 91, 8–9	
TQ 280776	Wandsworth, Thames foreshore	1 potin	P?	Index	In artificially deposited gravel
	Norfolk				
TF 778028	Gooderstone, 1986	1 potin	O	Index	
TL 961901	Roudham, 1980–2	1 potin	Cl.I or II?	Index	
	Nottinghamshire				
SK 7080	Retford, near, 1987	1 potin	Early British type	*B.N.J.* 57, 125	
	Oxfordshire				
SP 5822	Bicester, near, 1985 or bef.	1 potin	P	Index	Wendlebury?
	Suffolk				
TL 8564	Bury St Edmunds, 1978	1 potin	O2	*Proc. Suff. Inst. Archaeol. Hist.* 33(2), 213–4	
TM 128492	Claydon, 1975, Papermill Lane	9 potin	Cl.I or II	*Proc. Suff. Inst. Archaeol. Hist.* 33(2), 213–4	Known site
	Surrey				
TQ 255603	Banstead	1 potin	Cl.I or II	*Sy.A.C.* 72, 237	
	Sussex				
TV 590963	Eastbourne, 1979, Bullock Down	1 potin	J	*Sx. Archaeol. Soc. Monogr.* 1	Excavations. Section across field lynchet
	Wiltshire				
SU 195727	Ogbourne St Andrew, 1985, by railway line	1 potin	L	*W.A.M.* 81, 141	
Continental	*France*				
	Limetz-Villez, Yvelines, 1983	1 potin	M	Inf. D. Nash	Excavations at fanum

Corrections: The potin coin from near Huntingdon 1982 (Haselgrove 1984, 123) is Class II.
Delete 1 potin Class I or II found at Sutton at Hone, Kent, which repeats the coin from Northview, Kent, TQ 542703 (Haselgrove 1984, 123).
The Braughing, Herts., potin Class II? is of type P and was found in a pit in the excavations at Wickham Kennels 1982 (ibid. 123).

COMMIOS

	Sussex			
SU 8608	Lavant area, c. 1985	1 *AV*	92	Index

Correction: Delete 1 *AV* Commios found at Hastings, 1872, which apparently repeats the coin of the same type found in 1857.

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
			TINCOMMIUS		
	Buckinghamshire				
SU 8394	West Wycombe, 1987	2 Æ	New type Cf. 106	Index	
	Hampshire				
SU 724029	Hayling Island, 1981, Temple	1 Æ/Æ	106	Inf. D. Nash	Excavations
		1 Æ/Æ	131B		As Haselgrove, 1984, 125. Some are apparently inscribed NVMVR, so attribution of all of them to Tincommius must be doubted
	Hayling Island, 1988, Temple?	1 Æ (?)	105	Inf. G. Soffe	Surface finds
		1 Æ (?)	106 reversed		
SU 3237	Nether Wallop, 1983, Danebury Hill	1 Æ¼	118	Inf. A. Burnett	See also British LZ, O, Q and Verica, Epaticcus
		1 Æ	New type	Index	
		1 Æ¼	New type		
SU 639624	Silchester, 1979–84, Forum Basilica	2 Æ¼	118	Boon 1985, Nos 11–12	Excavations
	Silchester, 1985–6	1 Æ	131B	Inf. M. Fulford; Boon forthcoming	Inscribed TIN[C]OM
	Kent				
TQ 7751	Boughton Monchelsea, 1987, Brishing	1 Æ	Cf. 100	Inf. D.B. Kelly; *Archaeol. Cantiana* 104, 353	
	Surrey				
SU 902495	Wanborough, 1983, Green Lane	2 Æ¼	97	Inf. J.P.C. Kent	See Epaticcus etc.
		3 Æ¼	99		
		1 Æ	100		
		1 Æ/Æ	100		
		1 Æ¼	104		
		24 Æ	105		
		2 Æ	106		
		15 Æ	106 (types to right)		
		3 Æ	New type		Obv: facing head. Rev: bull
		16 Æ	New type		Obv: saltire. Rev: lion
		32 Æ	New type		Obv: star. Rev: dolphin

	Sussex				
SU 862051	Chichester, 1966, St Mary's Hospital	1 Æ	New type	*Chichester Excavations* 1,49	Not in Haselgrove, 1978
TQ 2913	Haywards Heath	1 Æ	106a	Index	
	Wiltshire				
ST 989639	Bromham, 1980, Pipeline W of Mother Anthony's Well villa	1 Æ	96	*W.A.M.* 76, 176	

VERICA

	Buckinghamshire				
SU 8394	West Wycombe, 1982	1 Æ	New type	Index	Obv: panel. Rev: eagle
	Gloucestershire				
SP 017062	Bagendon, 1980	1 Æ/Æ	New type?	Inf. S. Trow	Excavation. Obv: bull. Rev: standing figure?
	Hampshire				
SU 4503	Fawley	1 Æ	121	*B.N.J.* 57, 125	
SU 724029	Hayling Island, 1982, Temple	1 Æ/Æ	123	Inf. D. Nash	Surface finds
		1 Æ/Æ↓	Cf. 118		
SU 327376	Nether Wallop, 1984, Danebury Hill	1 Æ	128	Inf. A. Burnett	See also British LZ, O, Q, Tincommius etc.
		2 Æ↓	119		
		2 Æ↓	New type		Obv: tablet VIR VAR. Rev: winged horse
		1 Æ↓	New type	Index	
SU 639624	Silchester, 1979–84, Forum Basilica	1 Æ↓	New type	Boon 1985, No. 13	Excavations. Obv: cross. Rev: trident
	Humberside				
SE 9218	Winterton?	1 Æ↓	New type Cf. 129	Index	Coins of this type were in the Waltham St Lawrence and Thames gravels finds
	Isle of Wight				
SU 4393	Thorness, 1986	1 Æ	125	*Britannia* 18, 351	
	London				
TQ 1778	Brentford, 1970, Thames foreshore	1 Æ↓	120c	Index	
	Norfolk				
TL 7288	Hockwold-cum-Wilton	1 Æ↓	New type	Index	
TF 887003	Saham Toney, Woodcock Hall	1 Æ↓	–	*Britannia* 17, 51–3	Possibly Verica
	Suffolk				
TM 1948	Tuddenham St Martin	1 Æ	New type	*Proc. Suff. Inst. Archaeol. Hist.* 36(4), 311	Obv: bull. Rev: standing figure

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
	Surrey				
SU 902495	Wanborough, 1983–6, Green Lane	2 AV	121	Inf. J.P.C. Kent	See Epaticcus etc.
		1 AV	125		
		8 AV¼	112		
		3 AV¼	113		
		2 AV¼	114		
		36 AR	115		
		50 AR	115 var.		No annulets
		24 AR	123		
		18 AR	128		
		24 AR	129		
		19 AR	131		
		19 AR	New type		Obv: panel. Rev: eagle
		29 AR	New type		Obv: bull. Rev: standing figure
		6 AR¼	132		
		3 AR¼	New type		Obv: eagle. Rev: boar's head
		3 AR¼	New type		Obv: sphinx. Rev: dog
		6 AR¼	New type		Obv: eagle. Rev: urn
		2 AR¼	New type		Obv: tablet. Rev: Pegasus
		3 AR¼	New type		Obv: bucranium. Rev: altar
		15 AR¼	New type		Obv: 2 cornucopiae. Rev: eagle
		5 AR¼	New type		Obv: acorn. Rev: seahorse?
		3 AR¼	New type		Obv: sphinx. Rev: head
		15 AR¼	New types		Types not given
	Sussex				
SU 861050	Chichester, 1984, Greyfriars	1 AR	–	*Britannia* 16, 313	
TQ 3215	Ditchling, 1986, 'Chitty's Field'	1 AV	125	*Sx.A.C.* 125, 238	
TQ 329158	Ditchling, 1987, Park Barn Farm	1 AR	115 var.	*Sx.A.C.* 126, 229	Legend COMI.F
TQ 275128	Henfield, Newtimber Hill	3 AR	New type	*B.N.J.* 57, 125	Obv: panel. Rev: eagle. Perhaps a small hoard?
TQ 255107	Poynings, 1984, Devils Dyke	1 AR	New type	Index	Obv: panel. Rev: eagle
SZ 843933	Selsey, 1986, on the coast	1 AV¼	112	*B.N.J.* 56, 178–80.	See also Epaticcus etc. Coins found in earth fallen from cliff
		2 AR	New type		Obv: bull. Rev: standing figure
		1 AR¼ in hoard	New type		Obv: boar's head. Rev: eagle

	Wiltshire				
SU 277660	Little Bedwin, outside W ramparts of Chisbury Camp	1 Æ	129	*W.A.M.* 77, 158	

Corrections: Delete 1 Æ¼ (M132) from near Princes Risborough (Haselgrove 1984, 126) which repeats Haselgrove 1978, 51.

EPPILLUS

	Essex				
TL 471125	Harlow, 1985–7, Harlow Temple	2 Æ	310	Inf. R. Bartlett	Excavations
		1 Æ	311		
		1 Æ	New type		
	Hampshire				
SU 8471	Binfield	1 Æ¼	New type	Shown B.M.	Obv: cruciform design. Rev: horse right EP
	Humberside				
SE 9826	North Ferriby, 1980	1 Æ	108	Inf. P. Didsbury	
	Kent				
TR 3069	Birchington, 1985	1 Æ	308	Index	
TQ 781593	Boxley, 1984	1 Æ	310	*Archaeol. Cantiana* 101, 370	
TR 148576	Canterbury, 1982, Marlowe Theatre	1 Æ/Æ	306	Index	Excavations
TQ 743763	Cliffe, 1985	1 Æ	Cf. 310	*Archaeol. Cantiana* 103, 252. Inf. D.B. Kelly	Found within 100 m of coin of Tasciovanus
TQ 788587	Detling, 1984, by the Pilgrim's Way	1 Æ/Æ	301	*Archaeol. Cantiana* 101, 269	
TR 362507	Upper Deal, 1987, St Richards Road	1 Æ	310	*Britannia* 19, 484	In 6th century AD grave
TR 0546	Wye	1 Æ	308	Index	
	Surrey				
SU 902495	Wanborough, 1983–6, Green Lane	10 Æ¼	107	Inf. J.P.C. Kent	See also Epaticcus etc.
		3 Æ¼	New type		Obv: crescent. Rev: horse
		1 Æ¼	302		
		42 Æ	108		
		27 Æ	305		
		26 Æ	New type		Obv: bearded head. Rev: boar
		2 Æ¼	New type		Obv: cross. Rev: horse
		3 Æ¼	New type		Obv: ram? Rev: bull's head
		4 Æ	New type		Types not given

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
	Sussex				
SZ 843933	Selsey, 1986, on the coast	1 AV¼ 1 AV¼ in hoard	107 302	*B.N.J.* 56, 178–80	See also Verica, Epaticcus etc.
		DUBNOVELLAUNUS – Essex types			
	Cambridgeshire				
TL 4658	Cambridge area	2 AV 1 Æ/AV	275A 275A	Shown B.M.	Found together
	Essex				
TQ 4785	Barking, 1986, Mucking Hall Farm	1 AV	275	*B.N.J.* 57, 126	
TQ 676948	Billericay, 1970	1 AV	275	Index	
TQ 911890	Wakering, 1986 or bef.	1 AV	275	Index	
	Suffolk				
TL 8750	Alpheton	1 AV	275	*Britannia* 18, 331	
		DUBNOVELLAUNUS – Kent types			
	Hertfordshire				
TL 391238	Braughing, 1983 or bef., Gatesbury	1 Æ	New type	Index	Obv: horseman, DVBN. Rev: backward-looking beast
TL 4719	Thorley, 1987	1 ÆR	New type	Index	Obv: coiled animal. Rev: backward-looking beast, DV
	Kent				
TR 3069	Birchington, 1985	1 ÆR 1 ÆR	288 New type	Index	Same type as Canterbury coin (below)
TR 154577	Canterbury, 1960, St Augustine's Abbey	1 Æ	290	*Kent Archaeol. Soc. Monogr.* 4 (1988), 236	Excavations. Surface of cemetery NE of quire
TR 147575	Canterbury, 1986, St Johns Lane	1 ÆR	New type	Noted by author	Obv: animal right. Rev: seated figure DV[]NO. Excavations
TQ 7376	Cliffe, Wharf Farm	1 Æ	New type Cf. 286	Index	
TQ 5566	Farningham, near	1 ÆR	Rev: cf. 288	Index	Dubnovellaunus?
TR 0161	Faversham, 1987 or bef., near	1 ÆR	287	Index	
	London				
TQ 297658	Beddington, 1981–2, Sewage Farm Roman villa	1 ÆR	286	Index	Excavations. Inscription on reverse

	Norfolk				
TF 887003	Saham Toney, Woodcock Hall	1 Æ	290	*Britannia* 17, 51–3	
			VOSENIOS – with SA		
	Hampshire				
SU 639624	Silchester, 1979–84, Forum Basilica	1 Æ	299	Boon 1985, No. 37 and forthcoming. Inf. M. Fulford	
	Kent				
TQ 4870	Ruxley, 1981	1 Æ	New type	Index	Obv: head left. Rev: horse left, SA beneath, as M299. Æ from Snodland (Haselgrove 1984, 119) may also be this series
TQ 297658	Beddington, 1981–2, Sewage Farm Roman villa	1 Æ	New type	Index	Same type as Ruxley. Excavations
	Surrey				
SU 902495	Wanborough, 1983–6, Green Lane	1 Æ/A	297	Inf. J.P.C. Kent	See also Epaticcus etc.
Continental	*France*				
	Eu, Seine-Maritime, 1974–8, Bois l'Abbé	1 A¼	298	*Traité de Numismatique Celtique* III	Excavations
			ADDEDOMAROS		
	Buckinghamshire				
TQ 0381	Iver, 1983 or bef.	1 A	267	Shown B.M.	
SU 8394	West Wycombe, 1982	2 A	267	Index	See also British A, Cunobelinus
	Hertfordshire				
TL 391238	Braughing, 1983 or bef., Gatesbury	1 Æ/A	267	Index	
	Kent				
TQ 5546	Leigh, 1985	1 A	268	Index	Or Leigh, Surrey?
	Norfolk				
TL 979857	East Harling, 1983–4	1 Æ/A	266	Index	
TF 8538	North Creake	1 Æ/A	266	*B.N.J.* 58, 144	See also Gallo-Belgic E
	Suffolk				
TM 2335	Shotley	1 A	269	*Britannia* 18, 332	
			TASCIOVANUS		
	Buckinghamshire				
SP 8003	Princes Risborough, 1983, Risborough Castle?	3 Æ	180	Index	2 found close together

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
SU 8394	West Wycombe, 1986	1 AV	150	Index	
	West Wycombe, 1988	1 AR	New type Cf. 185	Index	
	Cambridgeshire				
TL 3986	Chatteris, Langwood Hill	1 AV¼ in hoard	185	*B.M. Occ. Paper* 58, 5	See also Haselgrove 1984, 129
TL 2371	Huntingdon area	1 Æ	192	Index	
TL 185637	Southoe	1 AR	188	Index	Dias
	Essex				
TL 577187	Great Canfield, 1980	1 Æ	New type	*Essex Archaeol. Hist.* 13, 1981, 35–6	CAMLV legend
TL 471125	Harlow, 1985–7, Harlow Temple	1 AV¼	153	Inf. R. Bartlett	Excavations
		1 AR	158		
		1 AR	162		
		1 AR	163		
		5 Æ	167		
		4 Æ	168		
		2 Æ	169		
		3 Æ	170		
		2 Æ	171		
		6 Æ	172		
		4 Æ	174		
		5 Æ	175		
		3 Æ	176		
		4 Æ	177		
		8 Æ	179		
		5 Æ	180		
		1 Æ½	182		
		2 Æ½	183		
		4 Æ½	183a		
		6 Æ	190		
		6 Æ	192		
		3 Æ½	193		
		1 Æ	New type		
	Gloucestershire				
SO 996095	North Cerney, 1983, The Ditches	1 Æ	171	Inf. S. Trow	Surface find

	Hampshire				
SU 639624	Silchester, 1979–84, Forum Basilica	1 Æ	190	Boon 1985, No 17; Boon forthcoming. Inf. M. Fulford	Excavations
	Silchester, 1985-6, Forum Basilica	1 Æ	183b		
	Herefordshire				
SO 401724	Brandon Camp	1 Æ	–	*Britannia* 18, 78	Tasciovanus? Unstratified from Iron Age hillfort and Roman fort
	Hertfordshire				
TL 250338	Baldock, 1979 or bef., Walls Field allotments	1 Æ	176	Stead and Rigby (1986), 92–3, Nos 11, 17	Surface finds. The unstratified Tasciovanus new type from Upper Walls Common (Haselgrove 1978, 61 Baldock coin no. 14) is of the same type as the CAMLV coin from Great Canfield (above)
		1 Æ	189		
TL 251340	Baldock, 1980–7, Upper Walls Common	2 Æ	168	Inf. G. Burleigh	Excavations
		3 Æ	170		
		1 Æ	Cf. 171		
		1 Æ	172		
		1 Æ	177		
		3 Æ	179		
		1 Æ½	182		
		1 Æ½	Cf. 183		
		1 Æ½	183b		
		1 Æ	192?		
		1 Ⱥ	New type		Inscribed DIAS
TL 2534	Baldock	1 Æ	176	Inf. G. Burleigh	Possibly same coin as Stead and Rigby (1986), No. 11 above
TL 387236	Braughing, 1972, Ermine Street	1 Æ	172	*Herts. Archaeol.* 10, 28–9	For the 1971 coins from this excavation see Haselgrove 1978, 46
		2 Æ	Cf. 177		
		1 Æ	182		
		1 Æ	182?		
TL 3924	Braughing, 1982, Wickham Kennels	1 Æ	174	*Herts. Archaeol.* 8, 40–59	Excavations
TL 3925	Braughing, 1982 or bef.	1 Ⱥ	150	*S.C.B.I. S.E. Museums* No. 192	
TL 0506	Hemel Hempstead	1 Ⱥ	186	*B.N.J.* 58, 144	
TL 389238	Puckeridge, 1983 or bef., opposite Smiths	2 Æ	Cf. 171	Index	
		3 Æ	172		
TL 387239	Puckeridge, Roundabout	1 Ⱥ	164		

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
		2 Æ	172		
		1 Æ	175		
		1 Æ	179		
		1 Æ½	Cf. 182		
		2 Æ	183		
TL 135070	St Albans, 1938, Insula XVII	1 Æ	174	*Archaeologia* 90, 81–126	Not in Allen 1960 etc. Excavations
TL 136073	St Albans, 1956, Verulamium Car Park	1 Æ	175	*S.C.B.I. S.E. Museums* No. 207	Excavations. Not in Allen 1960 etc.
TL 125065	St Albans, Prae Wood	1 Æ	New type	Index	Obv: pattern. Rev: as 164
TL 117079	St Albans, 1973–82 Gorhambury	1 A	167	Neal et al., 1990, 110 Nos 1–3	Excavations
		1 A	170		
		1 A	190		
TL 1507	St Albans area	1 A	155	Index	
TL 4719	Thorley	1 A	Cf. 158	Index	
SP 9510	Tring, Pendley House, Cow Roast	1 A	New type	Shown B.M.	Boar right. From Roman site. See also Haselgrove 1978, 62 for another new type from here
TQ 1196	Watford area	1 A	New type	Shown B.M.	Tasciovanus?
TL 265298	Weston, 1988, in field	1 Æ	170	Inf. G. Burleigh	
	Kent				
TQ 722592	Aylesford, 1984	1 Æ	Cf. 167	*Archaeol. Cantiana* 101, 365	Rev: horse left
TQ 743763	Cliffe, 1985	1 Æ	173	*Archaeol. Cantiana* 103, 252; Inf. D.B. Kelly	Found within 100 m of coin of Eppillus
TQ 7376	Cliffe, Wharf Farm	1 Æ	171	Index	
TR 2666	Isle of Thanet, 1987, NW corner	1 A	196 var.	Index	
	London				
TQ 1276	Hounslow Heath, 1981, in a garden	1 A¼	152	Shown B.M.	
	Norfolk				
TF 909058	Ashill, c. 1980	1 Æ/A	149	Index	
		1 Æ	172		
TL 941840	Brettenham, 1980	1 Æ	176	Index	
TM 348902	Ditchingham, c. 1984	1 A	162	Index	
TL 868811	Thetford	1 Æ	182	Index	
	Northamptonshire				
SP 762655	Boughton, 1980	1 Æ	174	*Northants. Archaeol.* 16, 200	

SP 9871	Stanwick	1 Æ	180	Shown B.M.	Owner lives there
TL 084827	Thurning	1 AV	184	*Northants. Archaeol.* 18, 173	
TL 006794	Titchmarsh, 1984, Springfield	1 Æ	168–9	*Northants. Archaeol.* 20, 147–8	
	Oxfordshire				
SU 5794	Dorchester-on-Thames, bef. 1890	1 Æ	171	Evans 1890, 545	Not in Allen 1960 etc.
SU 576942	Dorchester-on-Thames, 1963, allotments site	1 Æ	190	*Archaeol. J.* 141, 130	Excavations
	Surrey				
TQ 0651	East Clandon, 1985	1 AV¼	152	*B.N.J.* 57, 125	East or West? Tasciovanus? Inscribed ANO

Corrections: The following coins are repeats and should be deleted: 1 Æ (M174) from near Milton Keynes (repeats Bradwell; Haselgrove 1978, 57); 1 Æ (M177) from Verulamium 1959 (repeats 1960 coin; Haselgrove 1978, 63)

CUNOBELINUS

	Avon				
ST 655744	Bath, 1979–80, Temple Precinct	1 AR	New type?	Sellwood 1988, 279	Obv: cf. 237. Rev: cf. 240. Excavations
	Bedfordshire				
TL 1638	Clifton, bef. 1890	1 Æ	244	*Proc. Cambs. Antiq. Soc.* 7 (NS 1), 152–6	Not in Allen 1960 etc.
TL 1848	Langford, bef. 1890	1 Æ	242	*Proc. Cambs. Antiq. Soc.* 7 (NS 1), 152–6	Not in Allen 1960 etc.
TL 1649	Sandy, 1984	1 AR	239	Index	Next to old cemetery
	Buckinghamshire				
SP 811118	Aylesbury, 1977–80, Walton Court	1 Æ	249	*Rec. Bucks.* 23, 51–75	Surface find from known site
SP 8213	Aylesbury, outskirts of	1 Æ/AV	207	Index	
SP 8901	Great Missenden	1 AR	New type	Index	Obv: head right CVNOBELINVS Rev: Victory walking right. Same type as West Wycombe coins
SP 895527	Olney, 1970, Ashfurlong	1 Æ	253	*Bull. Northants. Fed. Archaeol. Soc.* 5, 25	Known site.
SP 839427	Stanton Low	1 Æ	248	Inf. C. Johnson	Excavations
SU 8394	West Wycombe, 1982	1 AR	235	Index	See also British A, Addedomaros
		3 AR	237		
	West Wycombe, 1982, 1986–8	3 AR	New type		Same type as Great Missenden coin

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
	West Wycombe, 1986–8	7 Æ	237		
		1 Æ	238 var.		
		1 Æ	239		
		1 Æ	225		
		2 Æ	242		
		1 Æ	243		
		1 Æ	246		
		1 Æ	249		
	Cambridgeshire				
TL 4458	Cambridge, bef. 1854, 'near college walks'	1 AV	–	*Archaeol. J.* 11, 207–15	Or AV¼. Not in Allen 1960 etc. Dubious provenance?
TL 3986	Chatteris, Langwood Hill	1 Æ	253?	*B.M. Occ. Paper* 58, 5	See also Iceni
TL 4052	Haslingfield, bef. 1890	1 Æ	246	*Proc. Camb. Antiq. Soc.* 7 (NS 1), 152–6	Allen 1960, 287, without type
TL 3371	Huntingdon, near	1 Æ	246	Index	
		1 Æ	New type		Or Tasciovanus etc.?
TL 365457	Meldreth, 1816, Mettle Hill	1 Æ	–	*Archaeol. J.* 17, 117–27	Many of the coins called Cunobelinus by Braybrooke (= Neville) are in fact coins of Tasciovanus, and mistakes in the opposite direction are equally likely. In a Roman burial?
	Essex				
TM 0529	Ardleigh, 1987 or bef.	1 Æ	224 var.	Index	Excavations
		1 Æ	227		
		1 Æ	252		
TL 755229	Braintree, 1981–3, Fountain Hotel	1 Æ	225/229	*Britannia* 15, 307	Excavations. Obv: M225. Rev: M229
TL 7622	Braintree, 1985–6	1 Æ	New type	Index	Obv: cruciform ornament. Rev: horse left with branch over, cf. gold types. Excavations
TL 754228	Braintree, 1987, London Road	1 Æ	253?	*Britannia* 19, 457	Excavations
TL 7006	Chelmsford area, 1984	1 Æ	218	Index	
	Chelmsford area, 1987	1 Æ	New type	*B.N.J.* 57, 125	Obv: plant. Rev: Hercules
TL 997251	Colchester, Lion Walk	1 Æ	249	*Colchester Archaeol. Rep.* 4, 15	Excavations
TL 992252	Colchester, 1973–6, Balkerne Lane	1 Æ	Uncertain	*Colchester Archaeol. Rep.* 4, 15	Or Tasciovanus

TL 997252	Colchester, 1981, Culver Street	1 Æ	253	Index	Excavations
		1 Æ	–		Or Tasciovanus?
TM 0025	Colchester area	1 Æ	252	Index	
TM 0025	Colchester, 1985, in or near	1 Æ	230	Index	
		1 Æ	250		
		1 Æ	253		
TL 9825	Colchester, Sheepen Road	1 Æ	New type	Shown B.M.	As P.P.S. 44, 439-44
TL 6221	Dunmow, 1854 or bef.	1 A/	–	*Archaeol. J.* 11, 207–15	Or A/¼. Not in Allen 1960 etc.
TL 471125	Harlow, 1985–7, Temple	1 A/¼	209	Inf. R. Bartlett	Excavations
		2 AR	237		
		1 AR	239		
		1 AR	New type		
		19 Æ	221		
		1 Æ	222		
		3 Æ	223		
		2 Æ	224		
		9 Æ	225		
		2 Æ	229		
		6 Æ	230		
		3 Æ	231		
		40 Æ	242		
		34 Æ	243		
		53 Æ	244		
		11 Æ	245		
		27 Æ	246		
		1 Æ	247		
		74 Æ	248		
		64 Æ	249		
		12 Æ	250		
		6 Æ	251		
		9 Æ	252		
		29 Æ	253		
		9 Æ	260-260a		
		3 Æ	New type		
TL 387066	Nazeingbury, 1974–5	1 Æ	244	*Essex Archaeol. Hist.* 10, 29–117	Excavations
TL 5438	Saffron Walden, 1986	2 Æ	243	Index	
		1 Æ	244		

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
		1 Æ	246		
		2 Æ	248		
		2 Æ	249		
		1 Æ	253		
TL 5224	Stansted, 1854 or bef.	1 Æ	–	*Archaeol. J.* 11, 207–15	Or Æ¼. Not in Allen 1960 etc. Conceivably Stanstead Abbots, Herts., or a repeat of the Dunmow coin
TL 551232	Takely, 1987, Airport Catering Site	1 Æ	225	Index	See also British potin
		1 Æ	248?		
TQ 6376	Tilbury, 1987	1 Æ	218	*B.N.J.* 57, 125	
	Tilbury, 1987	1 Æ	New type		Obv: plant. Rev: Hercules
	Hampshire				
SU 639624	Silchester, 1979–84, Forum Basilica	1 Æ	250	Boon 1985, No. 27	Excavations
	Hereford and Worcester				
SO 8376	Kidderminster, near, 1986–7	1 Æ¼	204	*B.N.J.* 58, 144	See also Dobunni?
	Hertfordshire				
TL 250338	Baldock, 1925–30, Walls Field	1 Æ	242	Stead and Rigby 1986, 94, No. 26	Westell excavations in Roman cemetery
TL 250338	Baldock, bef. 1943, Walls Field	1 Æ	242	Stead and Rigby 1986, 94–5, Nos 27, 41	Surface finds
		1 Æ	249		
TL 250338	Baldock, 1982 or bef., Walls Field	2 Æ	243	Inf. G. Burleigh	Surface finds
		1 Æ	248		
TL 251340	Baldock, 1975–80, Upper Walls Common	2 Æ	243	Inf. G. Burleigh	Surface finds
		1 Æ	244		
		1 Æ	246?		
		1 Æ	248		
TL 251340	Baldock, 1980–7, Upper Walls Common	4 Æ	242	Inf. G. Burleigh	Excavations
		6 Æ	243		
		2 Æ	244		
		7 Æ	246		
		1 Æ	246?		
		3 Æ	248		
		2 Æ	249		
		1 Æ	260		
	Baldock, 1982–3, 1987, Walls Field	1 Æ	229?		

		1 Æ	242		
		1 Æ	243		
		1 Æ	246		
		2 Æ	248		
		3 Æ	249		
		1 Æ	250		
TL 389241	Braughing, 1949, Wickham Hill	1 Æ	243	*E. Herts. Arch. Soc. Trans.* 1952–4, 13–2, 120	Not in Allen 1960 etc. Excavations
TL 387236	Braughing, 1972, Ermine Street	2 Æ	221	*Herts. Archaeol.* 10, 28–9	For the 1971 coins from this excavation see Haselgrove 1978, 73
		1 Æ	230		
		1 Æ	242		
		1 Æ	243		
		1 Æ	248		
		1 Æ	249		
TQ 175939	Elstree, Edgewarebury Farm	1 AR	237	*B.N.J.* 58, 144	
TL 181322	Ickleford, 1981, in a field	1 Æ	248	Inf. G. Burleigh	
		1 Æ	249		
		1 Æ	249?		
TL 385242	Puckeridge, 1983 or bef., Car Park	1 Æ	242	Index	
TL 389238	Puckeridge, 1983 or bef., opposite Smiths	1 AR	216	Index	
		1 Æ	242		
TL 387239	Puckeridge, 1983 or bef., Roundabout	1 Æ	242		
		1 Æ	243		
		2 Æ	244		
		1 Æ	246		
TL 135070	St Albans, 1916 or bef., Verulamium	1 Æ	248	*S.C.B.I. S.E. Museums* No. 269	Not in Allen 1960 etc.
TL 117079	St Albans, 1973–82, Gorhambury	2 Æ	244	Neal et al., 1990, 110. Nos 5–13	Excavations
		1 Æ	248		
		3 Æ	249		
		2 Æ	250		
		1 Æ	251		
TL 4719	Thorley, 1987	1 AR	237	Index	
TL 265298	Weston, 1987, in a field	1 Æ	253	Inf. G. Burleigh	
	Humberside				
SE 932287	Brantingham, 1983, villa	1 Æ	243	Inf. J. Dent	Excavations
TA 364253	Holmpton, 1968	1 Æ	243	*Kingston upon Hull Mus. Bull.* 2 (Jan 1969), 8	

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
SE 9826	North Ferriby, 1979	1 Æ	251	Inf. P. Didsbury	
SE 9525	Redcliff, 1985, foreshore	1 Æ	221	*B.N.J.* 57, 125	
	Kent				
TQ 779512	Boughton Monchelsea, 1987–8, Brishing	1 Æ/AV¼	Wild	Inf. D.B. Kelly; *Archaeol. Cantiana*104, 353; 105, 303	
		1 AR	New type		Obv: cross pattern with CVNO in quarters (cf. Braintree?) Rev: Capricorn
TR 1557	Canterbury, near, 1982	1 AV¼	New type	Index	
TR 155577	Canterbury, St Augustine's Monastery	1 Æ	260	Index	Excavations
TQ 678689	Cobham, 1987	1 Æ	222	Inf. D.B. Kelly; *Archaeol. Cantiana* 104, 353	
TQ 516594	Otford, 1966	1 Æ	–	*Kent Archaeol. Rev.* 13, 4–6	Known site
TR 2457	Wingham, bef. 1986	1 AV	206–7?	Index	
TR 0546	Wye, 1986–7	1 Æ	231	Index	
	Wye, 1987	1 AR	New type	*B.N.J.* 57, 125	Obv: cruciform pattern. Rev: horse
	Norfolk				
TM 348902	Ditchingham	1 Æ/AV	203	Index	
		1 Æ	231?		
TL 944993	Griston, 1966	1 Æ/AV¼	Uncertain	Seen B.M.	Or Tasciovanus
TL 814884	Lynford, 1986	1 Æ	–	Index	Cunobelinus?
TF 887003	Saham Toney, Woodcock Hall	1 AR	236?	*Britannia* 17, 51–3	Known site
	Northamptonshire				
SP 819581	Brafield on the Green, 1982–3, Oxpath	1 AV	208	*Northants. Archaeol.* 18, 171–3; 20, 147–8	Known site
		1 Æ	225		
		1 Æ	242		
		1 Æ	249	Shown B.M.	
SP 811598	Little Houghton, 1982, Coneygree	1 Æ	246	*Northants. Archaeol.* 18, 171	Known site
SP 6763	Nobottle, 1985 or bef.	1 Æ	New type	Index	Cunobelinus? Obv: head. Rev: horse galloping left
SP 775536	Quinton, 1978 or bef.	1 Æ	244	*Northants. Archaeol.* 14, 103–4	Iron Age and Roman site
SP 9871	Stanwick	1 Æ	221	Shown B.M.	Owner lives there

		1 Æ	242		
TL 006794	Titchmarsh, 1984, Springfield	1 AV¼	204	Index	Near spot where Anglo-Saxon sceatta found 1983
	Titchmarsh, 1984, Springfield	1 Æ	221	*Northants. Archaeol.* 20, 147–8	
	Oxfordshire				
SP 5822	Bicester, near, 1985 or bef.	1 AR	237	Index	Wendlebury? AR M237 may repeat coin from Alchester, found 1977 (Haselgrove 1984, 133)
		1 Æ	246		
		1 Æ	249		
SP 4105	Stanton Harcourt, 1985, Gravelly Guy	1 Æ	246	Index	Excavations
	Suffolk				
TM 1754	Ashbocking	1 Æ	–	*Britannia* 18, 331	
TM 1350	Barham, 1980	1 AR	218	*Proc. Suff. Inst. Archaeol. Hist.* 35(1), 73	
TL 9447	Brent Eleigh, 1986	1 Æ	225	Seen B.M.	
TL 7670	Cavenham, 1981	1 Æ	249	*Proc. Suff. Inst. Archaeol. Hist.* 35(2), 156	
TM 1651	Henley, 1984	1 Æ	229	*Proc. Suff. Inst. Archaeol. Hist.* 36(1), 44	
TL 9172	Ixworth Thorpe, 1986	1 AR	–	*Proc. Suff. Inst. Archaeol. Hist.* 36(3), 228	
TL 863452	Long Melford, 1973, Chapel Field	1 Æ	260a	*Proc. Suff. Inst. Archaeol. Hist.* 32(3), 282–91	Known site
TL 8646	Long Melford, 1987	1 Æ	222	*Proc. Suff. Inst. Archaeol. Hist.* 36(4), 311	
TM 2547	Martlesham, 1986	1 AV¼	204-5	*Proc. Suff. Inst. Archaeol. Hist.* 36(3), 228	See also Haselgrove 1984, 133. Apparently a distinct coin
TM 2240	Nacton, 1983, Priory Farm	1 AV¼	205	*Proc. Suff. Inst. Archaeol. Hist.* 36(1), 45	
TL 7043	Wixoe, 1987	1 AR	214	*Proc. Suff. Inst. Archaeol. Hist.* 36(4), 313	
	Surrey				
TQ 0351	Clandon Park	1 Æ	Cf. 210	Index	Core of plated stater?
SU 902495	Wanborough, 1983, Green Lane	1 Æ/AV	203	Inf. J.P.C. Kent	See also Epaticcus, Verica etc. Cores devoid of plating
		4 Æ/AV¼	209 etc.		
		1 AR	New type		

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
Continental	*France*				
	60 km E of Bordeaux, Gironde, 1988	1 Æ	Uncertain	Inf. R. Boudet	A bronze coin, but the types are very close to those of Cunobelinus' gold series. Roman villa site
	Fluy, Le Moulin, Somme,	1 Æ	230	Inf. A. Fitzpatrick, S. Scheers	Gallo-Roman site
	Holland				
	Katwijk, The Brittenberg, Zuidholland, bef. 1975	1 Æ	Plastic A	Inf. A. Fitzpatrick, N. Roymans	Found on beach near lost Roman fort

The bronze Cunobelinus from Vertault, Côte d'Or (Allen 1960, 235) is M231; the coin from Saintes, Charente-Inférieur (*Blanchet Traité des Monnaies Gauloises*, 515, fn 2) is also a bronze of Cunobelinus (*Rev: Préhist. de l'Est de la France*, 5e Année, No.6, 3e sér., 161–182).

Corrections: Delete the coin from Castle Street, Canterbury (Haselgrove 1984, 132) which repeats Haselgrove 1978, 77.
Delete four coins from Verulamium 1959 (M244, 248) and SE gate (M248, 249) which repeat coins from the same sites (Haselgrove 1978, 75–6).
Alter Braughing (Haselgrove 1984, 132) to 2 Æ (M230, 242) Wickham Kennels 1982 excavations.
Alter Alcester, Warwicks. (Haselgrove 1978, 79 and 1984, 133) to Alchester, Oxon., SP 5620

ANDOCO

	Essex				
TL 471125	Harlow, 1985–7, Harlow Temple	1 Æ	200	Inf. R. Bartlett	Excavations
	Hertfordshire				
TL 251340	Baldock, c. 1975–80, Upper Walls Common	1 Æ?	Type unknown	Inf. G. Burleigh	Surface find
TL 250338	Baldock, bef. 1983, Walls Field	1 Æ	200		Surface find
TL 251340	Baldock, 1980–7, Upper Walls Common	1 AR	199		Excavations
		2 Æ	200		
TL 250338	Baldock, 1982, Walls Field	1 Æ	200		
TL 387236	Braughing, 1972, Ermine Street	1 AR	199	*Herts. Archaeol.* 10, 28-9	For the 1971 coin from this excavation, see Haselgrove 1978, 81
TL 135070	St Albans, 1985, Verulamium	1 Æ	200	Index	Excavations
	Leicestershire				
SK 5904	Leicester	1 AR	199	Index: *Spink Numismatic Circular* 97 (1989), 289	Said to have been found there

	Berkshire				
SU 5579	Aldworth	1 Æ	263	Index	
	Buckinghamshire				
SP 811118	Aylesbury, 1977–80, Walton Court	1 Æ	263a	*Rec. Bucks.* 23, 51–75	Surface find from known site
	Hampshire				
SU 3853	Hurstbourne Tarrant, 1985	4 Æ in hoard	263a	*Britannia* 17, 420	
SU 327376	Nether Wallop, 1984, Danebury Hill	1 Æ	263	Inf. A. Burnett	Found with other coins including British LZ, O.
		1 Æ	New type		Obv: charging bull right. Rev: eagle left, probably Epaticcus
	London				
TQ 182773	Richmond on Thames, c. 1977, opposite Old England	1 Æ	263?	*S.C.B.I. S.E. Museums* No. 293; Index	Or M265? (CARA)
	Surrey				
SU 902495	Wanborough, 1983–6, Green Lane	217 Æ	263	Inf. J.P.C. Kent	This find is discussed more fully in the introduction. See also Eppillus, Verica etc.
		22 Æ	263a		
		1 Æ	New type		Obv: panel. Rev: lion
		1 Æ	New type		Not given
		17 Æ¼	264		
		7 Æ¼	New type		Obv: lion? Rev: double lozenge
		6 Æ¼	New type		Obv: elmeted head. Rev: horse
		9 Æ¼	New type		Not given
	Sussex				
TQ 075203	Gay Street, 1983, SE of Beedings	1 Æ	263a	*Sx.A.C.* 122, 217	
SZ 8593	Selsey, 1978, beach	1 Æ	263	Index	
SZ 843933	Selsey, 1986, on the coast	2 Æ	263	*B.N.J.* 56, 178–80	See also Verica etc. Coins found in earth fallen from cliff
		2 Æ in hoard	263a		
	Wiltshire				
SU 277660	Little Bedwin, 1981, outside W ramparts of Chisbury Camp	1 Æ	263	*W.A.M.* 77, 158	
SU 186719	Ogbourne St Andrew, 1985, SW of village	1 Æ	263	*W.A.M.* 81, 141	
SU 188720	Ogbourne St Andrew, –	1 Æ	263	*W.A.M.* 82, 184	
SU 127544	Upavon, 1983, in combe NE of Casterley Camp	1 Æ	263	*W.A.M.* 79, 255	

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
			CARATACUS		
	Buckinghamshire				
SU 8394	West Wycombe, 1988	1 *AR*	265	Index	
	Surrey				
SU 902495	Wanborough, 1983–6, Green Lane	7 *AR*	265	Inf. J.P.C. Kent	See also Epaticcus etc.
		3 *AR*½	New type		Obv: CARA. Rev: Pegasus
	Sussex				
SZ 843933	Selsey, 1986, on the coast	2 *AR* in hoard	265	*B.N.J.* 56, 178–80	See also Verica, Epaticcus etc.
			AMMINVS		
	Hertfordshire				
TL 389238	Puckeridge, 1983 or bef., opposite Smiths	1 Æ/*AR*	313	Index	
		1 Æ	New type		Same type as Newington coin; bronze version of M313
	Kent				
TR 178371	Newington, 1988, Dollands Moor	1 Æ	New type	Inf. M. Leyland	Excavations; same type as Canterbury and Purton coins (Haselgrove 1984, 135)
			A? MINIMS		
	Essex				
TL 471125	Harlow, 1985–7, Temple	1 *AR*½	316	Inf. R. Bartlett	Excavations
			HAMPSHIRE THIN SILVER		
	Dorset				
SZ 170908	Hengistbury Head, 1911–12	1 *AR*	321?	Cunliffe 1987, 136–41	Excavations
	Hengistbury Head, 1913	1 *AR*	321?		
			DUROTRIGES – Uninscribed silver and bronze		
	Avon				
ST 6857	Camerton, 1982	2 *AR*–Æ	317-8	Index	See also Haselgrove 1984, 138
		1 Æ	318		
	Dorset				
ST 961030	Badbury Rings, c. 1982, W of hillfort	1 *AR*	317	*Proc. Dorset Nat. Hist. Archaeol. Soc.* 107, 158	See also finds from Badbury Rings area listed under Shapwick

SY 8494	Bere Regis, 1984–6, Robe Farm	36 Ar–Æ	317–318	Shown B.M.	There may be additional coins from here
		4 Ar¼ in scattered hoard?	319		
ST 8412	Blandford Forum, 1983, Hambledon Hill	1 Ar–Æ	317–8	Index	
		1Æ	318?		
	Blandford Forum, 1984, Hod Hill	1 Ar	317		
		2 Ar¼	319		
		1 Ar	320		
SY 639933	Bradford Peverell, 1986–7, Muckleford	5 Ar, 1 Æ/Ar	317	*Proc. Dorset Nat. Hist. Archaeol. Soc.* 109, 124	Found with two small silver ingots. Found within c. 50 sq. m in two groups
		1 Ar¼	319		
		12 Æ	318		
SY 9782	Corfe Common, 1980, Towns End (i)	31 Ar	317	B.N.J. 57, 8–9	Hoard partly registered in Haselgrove 1984, 136 as near Dorchester 1982 See also British A
		4 Ar¼ in scattered hoard	319		
SY 9782	Corfe Common, 1980, Towns End (ii)	2 Æ	318	B.N.J. 57, 8–9	From same site as scattered hoard; along with Roman coins from Domitian to Valentinian I
SY 6790	Dorchester, near, between Maiden Castle and Poundbury	6 Ar	317	Index	See also hoard from Winterbourne Monkton
		1 Æ/Ar	317		
		2 Ar	320		
SY 6788	Dorchester, near Maiden Castle	1 Ar¼	319	Index	
ST 999134	Gussage St Michael, 1987, Gussage Hill area	1 Ar	317	*Proc. Dorset Nat. Hist. Archaeol. Soc.* 109, 134	Over 100 Roman coins found in this area
ST 991131	Gussage St Michael, 1987, Gussage Hill area	1 Ar¼	319		Found within area of double banjo enclosure
SZ 170908	Hengistbury Head, 1976–8	4 Ar–Æ	317–8	Cunliffe 1987, 136–41	
	1979	2 Ar¼	319		
	–	1 Ar	317		
	–	2 Ar–Æ	317–8		
	–	3 Ar¼	319		One possibly Bushe-Fox
	–	2 Ar–Æ	317–8		Probably Hengistbury
	–	2 Ar¼	319		Probably Hengistbury
	1911	1 Ar	320		Not in Allen 1960 etc.
	1980-4	1 Ar	317		Excavations
	1980-4	1 Ar–Æ	317–8		
	1980-4	1 Ar¼	319		
	1980-4	1 Ar	320		
	1982	1 Ar	317	Shown B.M.	

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
	Hengistbury Head (cont.)				
	1986, Seaward Beach	1 AV–AR	317		
	1986, W of Double Dykes	1 AV–AR¼	319		
SY 956825	Norden, 1976, Norden Farm	1 AR	317	Shown B.M.	
SZ 000860	Ower, 1978, Cleavel Point	2 Æ	318	*Dorset Nat. Hist. Archaeol. Soc. Monograph* No. 6	Excavations
ST 8211	Shillingstone, 'in woodland near road bridge'	1 AR¼	319	Index	
ST 9603	Shapwick, 1983, Badbury Rings	5 AV	317	Index	See also British O. The records relating to this and the following finds are confused. The coins are listed hereunder the provenances reported to the Index. The similarity of the different groups suggests a single hoard. A total of 335 coins are listed here. Badbury Rings lies 1 km ENE of Crab Farm, Shapwick. See now Van Arsdell 1989b
		31 AR	317		
		3 Æ/AR	317		
		8 AR–Æ	317–8		
		1 Æ	318		
		2 AV¼	319		
		24 AR¼	319		
		11 AR¼	319 var.		
		13 AR in hoard	320		
ST 9502	Shapwick, 1983, Crab Farm	2 AV	317	Index	See also British O and Armorican
		12 AR	317		
		2 Æ/AR	317		
		6 AR–Æ	317–8		
		4 AV¼	319		
		5 AR¼	319		
		7 AR¼	319 var.		
		3 Æ/AR¼	319 var.		
		3 AR in hoard	320		
ST 9502	Shapwick, c. 1983, Shapwick/ Badbury Rings	24 AR	317	Index	See also British B, O, Q and Dobunni uninscribed
		4 AR–Æ	317–8		
		14 AR¼	319		
		8 AR¼	319 var.		
		7 AR in hoard	320		
ST 450015	Stoke Abbott, 1963–9, Waddon Hill	2 Æ–AR	317-8	*Proc. Dorset. Nat. Hist. Archaeol. Soc.* 101, 57	Excavations of Roman fort. This makes a total of 6 coins M317-8 from the excavations. See also Haselgrove1978, 85 & 89

SY 675882	Winterbourne Monkton, 1986, field E of Maiden Castle	16 ÆR 4 Æ/ÆR 1 ÆR¼ in hoard	317 317 319	*B.N.J.* 57, 11–12; *Proc. Dorset. Nat. Hist. Archaeol. Soc.* 109, 124	
ST 9806	Witchampton, 1986 or bef.	9 ÆR–Æ 1 ÆR or AV¼	317–8 319	Index	See also finds from Badbury Rings area.
–	Dorset, 1983	4 ÆR 42 ÆR–Æ 1 Æ 30 ÆR¼ 1 Æ/ÆR¼ 31 ÆR¼ 3 ÆR in hoard	317 317–8 318 319 319 319 var. 320	Index	Badbury Rings/Shapwick or another Dorset provenance?
	Gloucestershire				
SO 836198	Kingsholm, 1983, Gambier Parry Lodgesite	1 ÆR–Æ 1 Æ	317–8 318	Inf. P. Garrod	
SO 836202	Kingsholm, c. 1983, Plock Court playing field	1 ÆR–Æ	317–8	Inf. P. Garrod	
	Hampshire				
SU 1413	Fordingbridge, 1987 or bef.	24 ÆR–Æ 226 Æ 1 ÆR or Æ in hoard	317–8 318 317 var. or 318	Index	
SU 724029	Hayling Island, 1982, Temple	1 Æ	Cf. 318	Inf. D. Nash	Surface find. Obv: appears to show head left cf. M437
SU 327376	Nether Wallop, 1984, Danebury Hill	1 ÆR¼	319	Inf. A. Burnett	Found with other coins including British LZ, O
SU 4829	Winchester, 1977	1 ÆR	317	Index	Excavations
	Hereford and Worcester				
SP 0272	Alvechurch, 1988, Coopers Hill	1 ÆR	317	*B.N.J.* 58, 145	
	Hertfordshire				
TL 251340	Baldock, 1981, Upper Walls Common	1 Æ	318	Inf. G. Burleigh	Excavations
	Isle of Wight				
SZ 4877	Chale area, early 20th century	1 ÆR	317	*S.C.B.I. S.E. Museums* No. 294	
SZ 3589	Yarmouth Common	1 Æ/ÆR	317	*S.C.B.I. S.E. Museums* No. 295	

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
	Somerset				
ST 5222	Ilchester, 1981	1 Æ	318	Index	Excavations
ST 6635	Lamyatt Beacon	1 *A*–Æ	317–8	*Britannia* 17, 304–15	Surface finds from late Roman temple
		1 Æ	318		
ST 6825	South Cheriton	1 Æ	318	Index	
ST 493497	Westbury-sub-Mendip	1 *A*–Æ	317–8	*Somerset Archaeol. Nat. Hist.* 127, 21	
ST 7128	Wincanton, c. 1925–30, Mapperton	1 *A*	317	Index	
	Surrey				
SU 902495	Wanborough, 1983–6, Green Lane	38 Æ	318	Inf. J.P.C. Kent	See also Epaticcus etc.
	Wiltshire				
ST 8338	Brixton Deverill, 1981, probably Cold Kitchen Hill	1 *A*	317	*W.A.M.* 77, 158	
ST 884253	Donhead St Mary, 1985, Castle Rings Camp	83 *A*	317	*B.N.J.* 57, 9–11	Found half way up outer bank. Some of the coins were found with fragments of Roman pottery which appear to be unrelated
		3 Æ/*A*	317		
		2 *A*¼ in hoard	319		
ST 955542	East Cowston, 1982, E of village	1 *A*–Æ	317–8	*W.A.M.* 78, 132	
ST 8038	Maiden Bradley	1 *A*	317	Index	
		2 Æ	318		
		2 *A*¼	319		
SU 150590	Pewsey, 1986, Sharcott,	2 *A*	317	*W.A.M.* 82, 184	
ST 9736	Stockton, 1981 or bef., Stockton earthworks	6 *A*	317	*W.A.M.* 77, 158	2 coins may repeat Haselgrove 1984, 138
ST 9417	Tollard Royal, c. 1950, Berwick Down	1 *A*	320	*W.A.M.* 76, 87	Not in Allen 1960 etc.

Correction: Delete Hengistbury Head 1980 1 *A* new type (Haselgrove 1984, 136)—actually M320 (above).
Delete Ashtead (Allen 1960, 244) which repeats another coin.

DUROTRIGES – Uninscribed cast bronze

	Dorset				
SZ 170908	Hengistbury Head, 1980–4	1 Æ	Cast	Cunliffe 1987, 136–41	Excavations. See also Haselgrove 1984, 139
	Hampshire				
SU 1118	Rockbourne	1 Æ	342–6	Noted by author	Roman villa

	Suffolk				
TM 1266	Wetheringsett, 1987	1 Æ	361?	*Proc. Suff. Inst. Archaeol. Hist.* 36(4), 311	
		DOBUNNI – Uninscribed			
	Buckinghamshire				
SU 8394	West Wycombe, 1982	1 Æ	B	Index	May repeat and correct Haselgrove 1984, 139
	Dorset				
ST 9502	Shapwick, c. 1983, Shapwick/ Badbury Rings	1 Æ in hoard?	–	Index	'Early Dobunnic silver.' See also Durotriges uninscribed etc. Recorded with other possible hoard coins but not listed in Van Arsdell 1989b
	Essex				
TL 7006	Chelmsford, 1975	1 Æ	F	Index	Excavations
	Gloucestershire				
SP 017062	Bagendon, 1980	1 Æ	D	Inf. S. Trow	Excavations. See Haselgrove 1984, 139 for further excavation coins
SO 836198	Kingsholm, 1983, Gambier Parry LodgeSite	2 Æ	B	Inf. P. Garrod	
		1 Æ	I–J		
		1 Æ	J		
		2 Æ/Æ	J		
		1 Æ/Æ	Cf. J		
		1 Æ/Æ	New type		Cf. EISV but uninscribed. A similar coin from Bagendon (Haselgrove 1984, 139)
SO 834196	Kingsholm, 1985–6, Sandhurst Road	1 Æ	I–J	Inf. P. Garrod	Excavations on fortress defences
SU 232986	Lechlade, Leaze Farm	1 Æ	B	Index	
SO 829200	Longford, 1982, near brick pits off Sandhurst Lane	1 Æ/Æ	J	Inf. P. Garrod	Possibly redeposited from vicinity of fortress
SO 8320	Longford, Walham	1 Æ	I–J	Index	
SO 996095	North Cerney, 1984–5, The Ditches	1 Æ/Æ	A var.	Inf. S. Trow	Excavations
		2 Æ/Æ	C		
SU 018945	Somerford Keynes, 1986, Neighbridge	1 Æ, 1 Æ/Æ	B	Index	Many Roman coins from here
		1 Æ	D		
		1 Æ	F		

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
ST 790996	Uley, 1977, West Hill	1 Æ	B	Index	Excavations
	Hampshire				
SU 724029	Hayling Island, 1981, Temple	1 Æ/Æ	A	Inf. D. Nash	Excavations
	Hereford and Worcester				
SO 984364	Beckford, 1978–9	1 Æ	J	Index	Excavations
SP 074478	Cleeve Prior, 1986, E of Cleeve Hill	1 Æ	J	*W. Midlands Archaeol.* 29, 1; 30, 1. *B.N.J.* 58, 145	Roman site
SP 074479	Cleeve Prior, 1987	1 Æ	F		
SP 088499	Cleeve Prior, 1988, Cleeve Hill	1 Æ	B–C	Index; *B.N.J.* 58, 145	
SP 0847	North and Middle Littleton, 1986–7, Cleeve Hill	1 Æ	F	*B.N.J.* 58, 145	
		1 Æ	J		
	Northamptonshire				
SP 647600	Flore, 1983, Kings Lane	1 Æ/Æ	E	*Northants. Archaeol.* 20, 147–8	Corroded together with a third coin. See British LX bronze
		1 Æ	I		
	Oxfordshire				
SP 5620	Alchester, 1981 or bef.	2 Æ	D	Nat. Mus. Wales	
SP 5822	Bicester, near, 1985 or bef.	1 Æ	D	Index	Wendlebury? May repeat coin from Alchester (Haselgrove 1984, 140)
		1 Æ	D–E		
		1 Æ/Æ?	D–E		
		1 Æ	F		
		2 Æ	I–J		
		1 Æ/Æ?	O? (or D?)		
	Surrey				
SU 902495	Wanborough, 1983–6, Green Lane	4 Æ	A etc.	Inf. J.P.C. Kent	See also Epaticcus etc.
	Warwickshire				
SP 0957	Alcester?	1 Æ	I–J	Index	
	Wiltshire				
ST 902523	Bratton, c. 1982, N of Bratton Castle	1 Æ	A	*W.A.M.* 78, 132	
ST 991638	Bromham, 1980, Pipeline W of Mother Anthony's Well villa	1 Æ	F	*W.A.M.* 76, 176, No. 34	
ST 924532	Edington, 1986	1 Æ	E	*W.A.M.* 82, 184	
ST 959538	Erlestoke, 1982, allotment gardens	1 Æ	A	*W.A.M.* 78, 132	
ST 912579	Keevil, bef. 1914, The Henleys	1 Æ	C	*B.N.J.* 47, 19	Allen 1960, 285, as Inadequ. recorded
Continental	*France*				
	Eu, Seine-Maritime, 1974–8, Bois l'Abbé	1 Æ	A	*Traité de Numismatique Celtique* III	Excavations

Corrections: Delete 1 Æ D–F from Bath Temple precinct (previously misidentified) Haselgrove 1984, 140).
The Æ Dobunnic F listed as near Cricklade (Haselgrove 1984, 140) was found near Kingshill villa, SU 117926 (W.A.M. 77, 158).
Delete Uley, 1977–8, 3 Æ (Haselgrove 1989, 139) and see above and Dobunni irregular
Delete 1 Æ C from Trowbridge, Wilts., (Allen 1960, 249) and see Keevil, Wilts., above.

DOBUNNI – Inscribed

	Avon				
ST 655744	Bath, 1979–80, Temple precinct	3 Æ	389 (EISV)	Sellwood 1988, 279	Excavations
ST 6857	Camerton, 1982	1 Æ	387 (ANTED)	Index	See also Haselgrove 1984, 140, 142
	Gloucestershire				
SP 0106	Bagendon, c. 1981	1 Æ	387 (ANTED)	Inf. S. Trow	Surface find
SP 005117	Cirencester, 1949, Marsden, Northmoor Farm	1 Æ	396 (BODVOC)	*Proc. Cotteswold Nat. Field Club* 30.2, 202	Full findspot of coin given as Rendcomb in Allen 1960, 256
SP 183403	Ebrington, 1981	1 Æ	395 (BODVOC)	Inf. S. Clews	Found during earth removal for drive-way
SP 075212	Hazleton, 1969	1 Æ	387 (ANTED)	*R.C.H.M. Gloucestershire Cotswolds,* 65	
SO 836198	Kingsholm, 1983, Gambier Parry Lodge site	1 Æ	387 (ANTED)	Inf. P. Garrod	
		1 Æ/Æ	389 (EISV)		
SO 834196	Kingsholm, 1985-6, Sandhurst Road	1 Æ	389 (EISV)	Inf. P. Garrod	Excavations on fortress defences
SO 996095	North Cerney, 1983, The Ditches	2 Æ	389 (EISV)	Inf. S. Trow	Excavations
	North Cerney, 1984–5, The Ditches	1 Æ	387 (ANTED)		
SP 143045	Quenington, 1984, in a garden	1 Æ/Æ	393 (CORIO)	Inf. S. Clews	
	Gwent				
ST 471875	Caldicot	1 Æ	389 (EISV)	Inf. P.J. Casey	Roman settlement
	Hampshire				
SU 724029	Hayling Island, 1981, Temple	1 Æ/Æ	390	Inf. D. Nash	Excavations. Garbled inscription perhaps INAM?

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
SU 327376	Nether Wallop, 1984, Danebury Hill	1 *Æ*	396 (BODVOC)	Inf. A. Burnett	Found with other coins, including British LZ, O
	Hereford and Worcester				
SO 7875	Bewdley, 1986–7	3 *Æ*	388 (EISV)	*B.N.J.* 57, 126; 58, 145	Two found close together. See also Corieltauvi
SO 439558	Stretford Bridge, 1968	1 *Æ*	393 (CORIO)	*Trans. Woolhope Nat. Field Club* 39.2, 367	Found near line of Roman road
SO 567420	Withington, 1969, Whitestones	1 *Æ*	393 (CORIO)	*Trans. Woolhope Nat. Field Club* 39.2, 479–80	Found near line of Roman road
	Oxfordshire				
SP 5822	Bicester, near, 1985 or bef.	1 *Æ*	387 (ANTED)	Index	Wendlebury? May repeat coin from Alchester (Haselgrove 1984, 142)
	Warwickshire				
SP 0857	Alcester	1 *Æ*/*Æ*	385-6 (ANTED)	Nat. Mus. Wales	
SP 3052	Compton Verney, 1988, field by Kineton–Foss Way road	1 *Æ*	388 (EISV)	*B.N.J.* 58, 146	
SP 1251	Welford on Avon, 1987, Welford Pastures Farm	1 *Æ*/*Æ*	395 (BODVOC)	*W. Midlands Archaeol.* 30, 56; *B.N.J.* 58, 146	Roman site
SP 320628	Whitnash, 1976, Ashford Farm	1 *Æ*	393 (CORIO)	Shown B.M. *B.N.J.* 58, 146	Possibly imported with garden soil?
SP 090543	Wixford, 1987, field W of Three Horseshoes public house	1 *Æ*½	394 var. (CORIO)	*W. Midlands Archaeol.* 30, 56; *B.N.J.* 58, 146	
	Wiltshire				
ST 8987	Easton Grey, 1981 or bef.	1 *Æ*	387 (ANTED)	*W.A.M.* 77, 158	
		1 *Æ*	389 (EISV)		
Continental	*France*				
	Pernois, Somme, bef. 1912	1 *Æ*	391 (CATTI)	*Rev. Prehist. de l'Est de la France 5e année*, No.6, 3e sér, 161–182	Dubious provenance. The entry is confused. Bertrand's attributions are followed here but the Evans' plate number he gives are both BODVOC
		1 *Æ*	395 (BODVOC)		

Correction: The hoard found at Sherborne in or about 1903 (Allen 1960, 293; Hoard 34) was found at or near Sherborne, Glos., and not Sherborne, Dorset (*R.C.H.M. Gloucestershire Cotswolds*, 100).
Delete 1 *Æ* D–E found at Easton Grey, 1982 or bef. (Haselgrove 1987, 140) which probably repeats the coin found there in 1977.

DOBUNNI – Irregular or imitative types

	Berkshire				
SU 5579	Aldworth, 1979 or bef., on the ridgeway near Warren Farm	1 Æ	New type Cf. L	*S.C.B.I. S.E.Museums* No. 348	Same type as Lowbury Hill coin. Obv: head right. Rev: horse left, sun above dot-and-ring below
SU 3678	Lambourn, 2 miles E of	1 Æ	New type	Index	
SU 540823	Aston Upthorpe, Lowbury Hill	1 Æ	New type Cf. L	*S.C.B.I. S.E.Museums* No. 347	Same type as Aldworth coin
	Dorset				
SZ 170908	Hengistbury Head	1 Æ	–	Cunliffe 1987, 136–141	
	Gloucestershire				
ST 790996	Uley, 1978, West Hill	2 Æ	New type	Index	Excavations
	Hampshire				
SU 327376	Nether Wallop, 1984, Danebury Hill	1 Æ	New type Cf. M	Inf. A. Burnett	Other coins found here, including British LZ, O, Q etc.
	Wiltshire				
ST 8987	Easton Grey, 1982	1 Æ	M	*W.A.M.* 78, 132	Some confusion attaching to finds from here
SU 215695	Mildenhall, 1977, Black Field	1 Æ	New type	*W.A.M.* 74–5, 204	Same type as the Widdington coin (Haselgrove 1978, 98). This latter coin may in fact be from the settlement at SU 089524 on Charlton Down, Charlton, rather than from Rushall Down as previously reported (*W.A.M.* 76, 86)
SU 199739	Ogbourne St Andrew, 1985, Buckerfields	1 Æ	M	*W.A.M.* 81, 141	
SU 199738	Ogbourne St George, 1984, Buckerfields	1 Æ	M	*W.A.M.* 80, 242	
SU 134545	Upavon, 1982, near R. Avon	1 Æ	M	*W.A.M.* 78, 132	

Correction: Delete 1 Æ/Æ Dobunni Irregular New type, Hayling Island, 1977 (Haselgrove 1984, 141) and see British LZ silver above.

DOBUNNI – Uncertain

	Gloucestershire				
SO 836198	Kingsholm, 1983, Gambier Parry Lodgesite	3 Æ	–	Inf. P. Garrod	

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
SU 020945	Somerford Keynes, 1984	3 AR	–	*Britannia* 16, 302	One described as quarter stater. Not certain that these are distinct from the 1986 finds listed here
SU 018945	Somerford Keynes, 1986, Neighbridge	1 AR–Æ	Uncertain	Index	Many Roman coins found here
	Hereford and Worcester				
SO 8376	Kidderminster, near, 1987	1 AV	Uncertain inscribed	*B.N.J.* 58, 145	Fragmentary
	Surrey				
SU 902495	Wanborough, 1983–6 Green Lane	3 Æ/AV?	Cores	Inf. J.P.C. Kent	
	Warwickshire				
SP 328723	Stoneleigh, Motslow Hill Spinney	1 AR	–	Inf. L. Sellwood	
SP 216556	Stratford upon Avon, 1982, Tiddington NewPlace	1 AR	Uncertain	Inf. L. Sellwood	Excavations. See also Haselgrove 1984, 140
SP 265585	Wasperton, 1986	1 Æ/AV	Uncertain	*W. Midlands Archaeol.* 29, 57	Iron Age and Roman site. Obv: obscure. Rev: horse right. Or British uninscribed?
Continental	*W. Germany*				
	Xanten, 1985 or bef., Roman fort & colonia	1 Æ/AV?	Uncertain	Index	Excavations. Obv: branched emblem. Rev: uncertain. Not necessarily Iron Age
			CORIELTAUVI – Uninscribed		
	Hertfordshire				
TL 250338	Baldock, 1983, Walls Field	1 AR	W?	Inf. G. Burleigh	Excavations
	Humberside				
SE 9302	Manton	1 AR½	J	Index	
SE 9826	North Ferriby, 1980	2 AR½	ZA	Inf. P. Didsbury	
		2 AR½	ZB		
		2 AR½	ZD		
	North Ferriby, 1981	1 AR	V–X		
		2 AR½	ZB		
SE 9525	Redcliff, 1987	1 AR½	ZA	Inf. J. Creighton	Excavations
SE 954273	Welton, 1984	1 AR½	Cf. ZA	Inf. P. Didsbury	
	Leicestershire				
SK 5717	Barrow upon Soar, near, 1986	1 AR	V	Index	

SK 5904	Leicester, Red Cross Street–Harvey Lane	1 AR½	ZA	Inf. A. Fitzpatrick	Excavations
SK 6023	Wymeswold, near, 1987	1 AR	U	Index	
	Lincolnshire				
TF 1198	Caistor, near	1 AR	F var.	Index	'A few miles to the south'
SK 8476	Fenton, 1983	2 AR	U–W	*Lincs. Hist. Archaeol.* 19, 99	Or Fenton, near Newark?
TF 117766	Goltho, 1971, garden of Goltho Hall	1 AR	F	*Lincs. Hist. Archaeol.* 7, 6	Found whilst removing trees
TF 1989	Ludford, 1976	1 AR	X	*Lincs. Hist. Archaeol.* 15, 90–1	
TF 1989	Ludford?	1 AR	W	Index	
TF 0638	Osbournby	1 AR	F	*Lincs. Hist. Archaeol.* 17, 71	
	Norfolk				
TL 7287	Hockwold cum Wilton, 1987	1 AR	W	Index	
	Warwickshire				
SP 186698	Lapworth, 1987, S of Dicks Lane Bridge	1 AR	U	*W. Midlands Archaeol.* 30, 46–7	

CORIELTAUVI – Inscribed

	Cambridgeshire				
TL 4493	March, 1979, West Fen	1 AR in hoard?	458 (AVN)	*Coin Hoards* 6, No. 64	See also Iceni
	Hereford and Worcester				
SO 7875	Bewdley, 1986	1 AV	459 (VEP CORF)	*B.N.J.* 57, 126	See also Dobunni
	Hertfordshire				
TL 251340	Baldock, 1984, Upper Walls Common	1 AV	466 (VOL DUMNOV)	Inf. G. Burleigh	
	Humberside				
TA 241422	Cowden Sands, 1983	1 AV	459 (VEP CORF)	Inf. P. Didsbury	
SE 9825	North Ferriby, 1980	1 AR	458 (AVN OST)	Inf. P. Didsbury	
	North Ferriby, 1980	1 AR	464 (VEP CO)		

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
	North Ferriby, 1980	1 *R*	462 (DVMNO TIG)		
	North Ferriby, 1980	1 *R*	Cf. 467 (VOLISIOS DVMNO)		
	North Ferriby, 1981	1 Æ/*N*	456b (ESVP ASV)		
TA 0025	North Ferriby, 1979, dredged from Humber	1 *N*	460 (VEP CO)		
SE 981250	North Ferriby, – , foreshore	1 *R*	460b (VEP)		Within 20 m of cliff
SE 9222	Old Winteringham	1 Æ/*N*	456b (ESVP ASV)	Index	
SE 9525	Redcliff, 1986	1 *R*	464 (VEP OC)	*B.A.R.* 193, 15–16	Excavations
	Redcliff, 1987	2 *R*½	464b (VEP)	Inf. J. Creighton	One not certainly this
SE 9024	Whitton on Humber	1 *N*	460a (VEP CORF)	Index	
SE 945212	Winteringham	1 *R*	458 (AVN OS[T])	*Lincs. Hist. Archaeol.* 7, 7	Known R–B site
SE 7102	Wroot, 1987	1 Æ/*N*	456b (ESVP ASV)	*B.N.J.* 57, 126	
	Leicestershire				
SK 9017	Leicester, Peacock Pavement	1 *R*	New type? (VEP CO)	Inf. A. Fitzpatrick	Obv: cf. M464. Rev: cf. M456
SK 6023	Wymeswold, near, 1986	1 Æ/*N*	457 (AVN COST)	Index	or M459? VEP CORF?
	Lincolnshire				
SK 9988	Normanby by Spittal area	1 *R*	462 (DVMNOC TIGIR SENO)	Index	Owmby? May repeat earlier finds from here (Haselgrove 1984, 144–5)
		1 *R*	464 (VEP CORF)		
	Suffolk				
TL 7074	Mildenhall, near	1 *R*½	464b (VEP)	Index	

CORIELTAUVI – Uncertain

	Essex				
TL 471125	Harlow, 1985–7, Harlow Temple	1Æ/Ⱥ or Æ/Ⱥ	–	Inf. R. Bartlett	Excavations
	Humberside				
SE 9825	North Ferriby, 1980	2 Æ/Ⱥ	Uncertain	Inf. P. Didsbury	Corieltauvian?
	North Ferriby, –	1 Æ/Ⱥ	Uncertain		"
	Leicestershire				
SK 779266	Eaton, 1985, former Goady Marwood Quarry	1 Ⱥ	–	*Leics. Archaeol. Hist. Soc.* 60, 92	
	Lincolnshire				
TF 4571	Claxby by Alford, 1977	1 Ⱥ	–	*Lincs. Hist. Archaeol.* 13, 75	
TF 263691	Horncastle, 1969 or bef.	1 Æ/Ⱥ	–	*Lincs. Hist. Archaeol.* 3, 20	Or British K?
SK 9988	Normanby by Spittal	1 Ⱥ	New type	Index	Owmby?
TF 0638	Osbournby	1 Ⱥ	Uncertain	*Lincs. Hist. Archaeol.* 17 71	
TF 0170	Washingborough, 1986, area	1 Ⱥ	–	*Lincs. Hist. Archaeol.* 22, 31	

ICENI – Uninscribed

	Cambridgeshire				
TL 3986	Chatteris, 1982 or bef., Langwood Hill	1 Ⱥ in hoard?	III	*B.M. Occ. Paper* 58, 5	See also Haselgrove 1984, 146; Iceni inscribed, Tasciovanus
TL 4857	Cherry Hinton, 1957, 1981	2 Ⱥ	II(a)	Index	
TL 4493	March, 1979, West Fen	1 Ⱥ	III(a)	*Coin Hoards* 6, No. 64	See also Iceni inscribed and Corieltauvi
		1 Ⱥ	III(c)		
		1 Ⱥ in hoard?	IV(c)		
TL 4493	March, 1982, Field Baulk, Stonea	4 Ⱥ	II(a)	Inf. A. Chadburn	Preliminary notice Haselgrove 1984, 148. Found in 1st century AD pot. See also Iceni inscribed
		4 Ⱥ	II(d)		
		25 Ⱥ	II(e)		
		1 Æ/Ⱥ	II		
		43 Ⱥ	III(b)		
		125 Ⱥ	III(c–d)		
		4 Ⱥ	III		
		1 Ⱥ	IV(c)		
		10 Ⱥ in hoard	IV		

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
	Essex				
TL 992252	Colchester, 1976, Balkerne Lane	1 Æ	III(b)	*Colchester Archaeol. Rep.* 4, 15	Excavations
TL 997251	Colchester, 1972, Lion Walk	1 Æ	III(c)	"	Excavations
TL 997252	Colchester, 1981, Culver Street	1 Æ	VI(c)	Index	Excavations
	Hampshire				
SU 724029	Hayling Island, 1981, Temple	1 Æ/Æ	II(e) var.	Inf. D. Nash	Excavations
	Leicestershire				
SK 9118	Thistleton, near	1 Æ	III(a)	Index	
	Norfolk				
TF 7106	Barton Bendish	1 Æ	II(d)	Index	
TG 007203	Billingford, 1986	1 Æ	III(c)	Index	Roman roadside settlement. *Britannia* 17, 401
TL 941840	Brettenham, 1979	1 Æ	II	Index	
TL 939839	Colchester, 1982	1 Æ/Æ	IV		
TG 371085	Burlingham, 1984–5	1 Æ	II	Index	
		2 Æ	II(c)		
		1 Æ	II(d)		
		1 Æ	III(a)?		
		2 Æ	III(b)		
		1 Æ	III(b)?		
TG 3708	Colchester, 1988 or bef.	2 Æ	III(b)	Index	
TG 239038	Caistor St Edmund, 1985	1 Æ	II(d)	Index	
		1 Æ	II(e)		
	Caistor St Edmund, 1984	1 Æ	III(c)		
	Caistor St Edmund, 1986	1 Æ/Æ	III(d)		
TG 235032	Caistor St Edmund, 1983–4	1 Æ	III(d)		
		1 Æ	IV(a)		
		1 Æ	IV(b)		
TF 715238	Congham, 1984	1 Æ	III(d)	Index	
TG 171094	Costessey, 1986, Bowthorpe	1 Æ	III(b)	*Britannia* 18, 330	
TM 348902	Ditchingham, 1984	1 Æ	II(d)	Index	
		4 Æ	II(e)		
		1 Æ	II		
		5 Æ	III(a)		
		1 Æ	III(c)		

		2 Æ	III(c)?		
		1 Æ	III(d)		
		1 Æ	III		
TF 680064	Fincham, 1986	1 Æ	IV	*Britannia* 18, 330	
TL 717948	Methwold, 1984–5	2 Æ	II(d)	Index	
		1 Æ	II		
TF 7111	Narborough, 1987–8?	1 Æ	II(a)	Index	
TM 400998	Norton sub Course, 1984	1 Æ in hoard	II(e)	Index	See also British LX bronze and Iceni inscribed
TM 4198	Norton sub Course, 1986	1 Æ	IV	*Britannia* 18, 331	See also hoard
TF 745035	Oxborough, 1984	1 Æ	III(a)	Index	
TF 722137	Pentney, 1982	1 Æ	III(b)	Index	One may repeat Haselgrove 1984, 147
	Pentney, 1979–81	2 Æ/Æ½	IV(d)		
TM 1579	Scole, 1982–3 Scole House	7 Æ	II(e)	*B.M. Occ. Paper* 58, 7–12	See also Iceni inscribed.
		8 Æ	III(b)		Preliminary notice in Haselgrove 1984, 149
		42 Æ	III(c–d)		
		2 Æ in hoard	IV(c)		
TF 7333	Snettisham, 1987, in field beside Bircham road (i)	1 Æ in hoard	III(a)	B.M.; *Britannia* 19, 456	See also British J etc.
TF 7333	Snettisham, 1988, in field beside Bircham road (ii)	2 Æ in hoard	III(a)	B.M.	See also British J etc.
TQ 089040	Wicklewood, Crownthorpe	7 Æ	III(a)	Index	
		1 Æ	II var.		
		1 Æ	IV(a) var.		
		2 Æ	IV		
		2 Æ	III(a) var.		
	Suffolk				
TM 1350	Barham, 1980	1 Æ	VI(e)	*Proc. Suff. Inst. Archaeol. Hist.* 35(1), 73	
TM 5384	Benacre, 1980	1 Æ	III	*Proc. Suff. Inst. Archaeol. Hist.* 35(4), 321	
TL 9447	Brent Eleigh	1 Æ	III?	Shown B.M.	Face/Horse?
TL 8564	Bury St Edmunds, 1986	1 Æ	II(e)	*Proc. Suff. Inst. Archaeol. Hist.* 36(3), 226	
TM 1152	Coddenham, Baylham House	1 Æ	II(a)	Index	
TM 5281	Covehithe, 1978	1 Æ	IV(a)	*Proc. Suff. Inst. Archaeol. Hist.* 34(3), 214	
TM 529818	Covehithe, 1986–7	1 Æ	II(e)	Index	

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
		1 Æ	IV		
TL 6163	Exning, 1983	1 Æ	IV	*Proc. Suff. Inst. Archaeol. Hist.* 35(4), 322	
TM 2348	Great Bealings, 1985	1 Æ	IV	*Britannia* 18, 331	
TM 2550	Hasketon, 1985	1 Æ½	IV(d) or VI(d)?	*Britannia* 18, 332	
TL 7772	Icklingham, 1983	1 Æ	III(b)	Index	
TL 7182	Lakenheath, 1979	1 Æ	II var.	*Proc. Suff. Inst. Archaeol. Hist.* 34(4), 291	
TL 7074	Mildenhall, near	1 Æ½	II(b)	Index	
		1 Æ	II?		
TL 9270	Packenham, 1986	1 Æ	II(d)	*Proc. Suff. Inst. Archaeol. Hist.* 36(3), 228	Roman coins etc. also found here
TL 965810	Riddlesworth	1 Æ½	IV(d)	Index	
TM 1266	Wetheringsett, 1985	1 Æ	II(c)	*Britannia* 18, 332	
		1 Æ	IV		
TM 2648	Woodbridge	1 Æ	II(e)	*Proc. Suff. Inst. Archaeol. Hist.* 36(3), 230	
	Surrey				
SU 902495	Wanborough, 1983–6, Green Lane	1 Æ	II(a)	Inf. J.P.C. Kent	See also Epaticcus etc.
		3 Æ	III(b)		
			ICENI – Inscribed		
	Cambridgeshire				
TL 3986	Chatteris, 1982 or bef., Langwood Hill	2 Æ in hoard?	V–VIII	*B.M. Occ. Paper* 58, 5	See also Haselgrove 1984, 147. See also Iceni uninscribed and Tasciovanus
TL 4493	March, 1979, West Fen	1 Æ	V(b)	*Coin Hoards* 6, No. 64	See also Corieltauvi and Iceni uninscribed. Coin of Augustus also found
		1 Æ	VI(a)		
		2 Æ in hoard?	VIII		
TL 4493	March, 1982, Field Baulk, Stonea	1 Æ	II(f)	Inf. A. Chadburn	Preliminary notice in Haselgrove 1984, 148. Found in 1st century AD pot. See also Iceni uninscribed
		189 Æ	V(b)		
		170 Æ	VI(a)		
		96 Æ	VI(b–c) incl. plated		
		73 Æ	VII		

		86 Æ	VIII incl. plated	
		10 Æ	IX(a) incl. plated	
		14 Æ	IX(b)	
		13 Æ in hoard	VII–IX	
TF 4609	Wisbech, bef. 1950, Harecroft Road	1 Æ	V(b)	*S.C.B.I. S.E. Museums* No. 354
	Norfolk			
TF 713063	Barton Bendish	1 Æ	VI	Index
TG 007203	Billingford, 1984–5	1 Æ	V(b)	Index
		1 Æ	VI(b)	
TG 371085	Burlingham, 1984–5	1 Æ	V(b)	Index
		1 Æ	VI(a)	
		1 Æ	VI(a–b)	
		1 Æ	V(b)–VI(a)	
		1 Æ	VII	
		1 Æ	IX(b)	
	Burlingham, 1986–7	1 Æ	V(b)	Index
TG 235032	Caistor St Edmund, 1983–4	6 Æ	V(b)	Index
TG 239038	Caistor St Edmund, 1985	2 Æ	V(b)	
	Caistor St Edmund, 1984	1 Æ	VI	
TG 240039	Caistor St Edmund, 1983–4	1 Æ	V(b)–VI	
	Caistor St Edmund, 1985	1 Æ	VI(b)	
	Caistor St Edmund, 1986–7	1 Æ	V(b)	
TF 762223	Castle Rising, 1987	1 Æ	VII–VIII	Index
TM 348902	Ditchingham, c. 1984	10 Æ	V(b)	Index
		1 Æ	V(b) var.	
		2 Æ	VI	
		1 Æ/Æ	VI	
TF 680064	Fincham, 1985	1 Æ	V(b)	Index
TF 7702	Gooderstone, 1984 or bef.	1 Æ	V(b)	Index
TM 400998	Norton sub Course, 1984	1 Æ in hoard	V(b)–VI	Index
TM 401996	Norton sub Course, 1985	1 Æ	V(b)	Index
		1 Æ	VI(a)	

See also British LX bronze and Iceni uninscribed

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
TF 745035	Oxborough, 1984	1 *Æ*	V(b)	Index	
		2 *Æ*	VI(a)		
TM 1579	Scole, 1982–3, Scole House	36 *Æ*	V(b)	*B.M. Occ. Paper* 58, 7–12	Preliminary notice in Haselgrove 1984, 149. See also Iceni uninscribed. Hoard also contained 86 Roman *Æ* to Tiberius and a denarius of Nero c. AD 60–1.
		57 *Æ*	VI(a)		
		6 *Æ*	VI(b)		
		4 *Æ*	VI(c)		
		11 *Æ*	VII		
		26 *Æ*	VIII		
		1 *Æ*	IX(a)		
		2 *Æ* in hoard	IX(b)		
TG 014193	Swanton Morley	1 *Æ*	V(b)	Index	
		1 *Æ*	VIII		
TF 769150	Westacre	1 *Æ*	V(b) or VI	Index	
TQ 089040	Wicklewood, Crownthorpe	3 *Æ*	V(b)	Index	
		1 *Æ*	VI(a)		
TG 0702	Wicklewood, Crownthorpe	1 *Æ*½	VII var.	Index	
	Suffolk				
TM 1754	Ashbocking, 1985	1 Æ/*Æ*	V(b)	*Britannia* 18, 331	
TL 9447	Brent Eleigh, 1987	1 *Æ*	V(b)	*Proc. Suff. Inst. Archaeol. Hist.* 36(4), 309	
TM 5281	Covehithe, 1978	1 *Æ*	V(b)	*Proc. Suff. Inst. Archaeol. Hist.* 34(3), 214	
		1 *Æ*	VIII		
TM 3156	Hacheston, 1973–5	2 *Æ*½	VI(d)	*N. C. (Ser. 7)* 18, 176	Excavations
	Hacheston, 1976	1 *Æ*	VI	*Proc. Suff. Inst. Archaeol. Hist.* 34 (1), 74	Redeposited topsoil removed from surface of field for Wickham Market bypass with other coins
		1 *Æ*½	VI(d)		
TM 5286	Kessingland, 1985	2 *Æ*	V(b)	*Britannia* 18, 332	Corroded together
TL 7074	Mildenhall	1 *Æ*	VIII	Index	Found with Claudian coins
TM 1359	Stonham Aspal, 1986	1 *Æ*	V(b)	*Proc. Suff. Inst. Archaeol. Hist.* 36(3), 229	
	Surrey				
SU 902495	Wanborough, 1983–6, Green Lane	2 *Æ*	V(b)	Inf. J.P.C. Kent	See also Epaticcus etc.
		1 *Æ*	VI(a)		
		1 *Æ*	VIII		

Correction: Delete 1 *Æ* Iceni VI(a) from Portsmouth 1830 hoard (Allen 1960, 264). The coin appears to be intrusive (*B.N.J.* 50, 1–6).

ICENI – Uncertain

	Cambridgeshire				
TL 449937	Wimblington, 1981, Stonea Grange	1 Æ	–	*Britannia* 13, 365	Excavations
	Essex				
TL 471125	Harlow, 1985–7, Harlow Temple	2 Æ/Æ	Irregular	Inf. R. Bartlett	Excavations
TQ 6376	Tilbury	1 Æ	Uncertain	Index	
	Hertfordshire				
TL 251340	Baldock, 1984, Upper Walls Common	1 Æ	Uncertain	Inf. G. Burleigh	Excavations
	Leicestershire				
SK 9118	Thistleton, near	1 Æ½	Uncertain	Index	
	Norfolk				
TL 9383	Brettenham	2 Æ	Uncertain	Index	One new type?
TF 776028	Gooderstone, 1982	1 Æ	Uncertain	Index	
TM 023895	Quiddenham	1 Æ	–	Index	
	Suffolk				
TM 308591	Hacheston, 1973–5	14 Æ	–	*N.C. (Ser.7)*, 18, 176	Excavations on Roman rural settlement. May repeat coins given in *P.S.I.A.H.* 33–34
TL 7283	Lakenheath, 1985	3 Æ	–	*Britannia* 18, 332	
	Surrey				
SU 902495	Wanborough, 1983–6, Green Lane	4 Æ	–	Inf. J.P.C. Kent	See also Epaticcus etc.

MISCELLANEOUS BRITISH OR GAULISH

	Essex				
TL 471125	Harlow, 1985–7, Harlow Temple	1 Æ	New type	Inf. R. Bartlett	Excavations
	Hampshire				
SU 724029	Hayling Island, 1982, Temple	1 Æ/Æ?	New type?	Inf. D. Nash	Surface find. Obv: horse left. Rev: horse right.
	Hayling Island, 1981, Temple	1 Æ	Thin silver		Excavations. Cf. Haselgrove 1984, 136
SU 637618	Silchester, S of walled area	1 Æ	Evans G9	Inf. M. Fulford; Boon forthcoming	British imitation of Scheers No. 111 or 121?
	Kent				
TR 273674	St Nicholas at Wade, Thanet, 1986 or bef., near roundabout	1 Æ	New type	*B.N.J.* 56, 181–2	Obv: confronted heads. Rev: horse left. Rev looks probably British
	Sussex				
TV 5598	East Dean, 1984–5	1 Æ	New type	Index	Same type as St Nicholas at Wade coin

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
SZ 843933	Selsey, 1937, West Beach	1 AR	M86	*S.C.B.I. S.E. Museums* No. 123	The second find from here. Probably a British South Coast type
	Wiltshire				
SU 1657	Pewsey, 1980, Denny Sutton Hipend	1 Æ	New type?	*W.A.M.* 76, 176	
			ARMORICAN		
	Cheshire				
SJ 2289	Meols, 1863 or bef.	2 AR billon	Coriosolites?	*Cheshire Archaeol. Bull.* 9, 6-8	Described as 'the usual type found in the Channel Islands'. Dubious provenance? Cf. Evans 1864, 120 for a find including Gaulish coins 'at or near Liverpool'
	Dorset				
SY 6790	Dorchester, near, between Maiden Castle and Poundbury	1 AR billon	Coriosolites Cl.I–VI	Index	
SZ 170908	Hengistbury Head	1 AR billon	Coriosolites Cl.V–VI	Cunliffe 1987, 136-141	
		1 AR billon	Cl.I–VI		
		1 AR billon	Cl.VI		In B.M.; probably Hengistbury Head
		1 AV¼	Aulerci Diablintes Cf. DLT XXI 6502?		
ST 9502	Shapwick, 1983, Crab Farm	1 AR in hoard?	DLT XXV 10400	Index	See also Durotriges uninscribed etc. Recorded with other possible hoard coins, but not in Van Arsdell 1989b
	Hampshire				
SU 724029	Hayling Island, 1981, Temple	1 AR billon	Biocasses DLT XXV 6969/6978	Inf. D. Nash	
SU 3853	Hurstbourne Tarrant, 1986	1 AV	Biocasses DLT XXIV 6947	*B.N.J.* 58, 140	

SZ 6399	Portsmouth, 1830	Several Æ billon in hoard	Includes Coriosolites Cl.II, III, & VI	*B.N.J.* 50, 1–6 Uncertain and Allen 1960, 241–2, 245.	For other coins from this hoard see British LZ silver. This problematical find has been reassessed by Robinson, who shows that the Armorican coins in the hoard were Coriosolites issues and rejects a number of other coins previously said to have been from the find
		1 Æ¼	Coriosolites?		
SU 639624	Silchester, 1985–6, Forum Basilica	1 Æ billon	Coriosolites Cl.II	Inf. M. Fulford; Boon forthcoming	
	Kent				
TR 2035	Sandgate, 1975	1 Æ billon	Coriosolites Cl.II	*Seaby C.M.B.* Nov. 1975, H 5305	See Haselgrove 1978, 122 for another Armorican coin from here. The date suggests they were found together
	Lincolnshire				
TF 4571	Claxby, near	1 Æ billon	Namnetes	Index	Near site of villa
	Wiltshire				
SU 2453	Collingbourne Ducis	1 Æ	DLT XXIII 6870	*W.A.M.* 76, 88	Found 'at Lake'

Correction: Delete 4+ Æ Baiocasses from Portsmouth 1830 (Allen 1960, 274). These coins appear to be intrusive (*B.N.J.* 50, 1–6). Reexamination of the coin published as 1 Æ Coriosolites Class V from Meare East Lake Village (Haselgrove 1978, 121) suggests that it is actually Dobunnic–Uncertain (*Somerset Levels Papers* 13 (1987) 169).

MISCELLANEOUS GAULISH – Gold

	Dorset				
SZ 170908	Hengistbury Head, 1986, Seaward Beach	1 Æ	Scheers No. 15	Shown B.M.	Allen XB
SY 036786	Swanage, 1987, under the cliffs	1 Æ	Scheers No. 15	*Proc. Dorset. Nat. Hist. Archaeol. Soc.* 109, 124	Allen XB
	Kent				
TR 0546	Wye	1 Æ¼	Scheers No. 4	Index	Allen XA
	Norfolk				
TF 909058	Ashill, c. 1979	1 Æ	Scheers No. 29	Index	Allen XE; said to be this

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
			MISCELLANEOUS GAULISH – Silver		
	Avon				
ST 755644	Bath, 1979–80, Temple Precinct	1 *Æ* base	New type?	Sellwood 1988	Excavations. Possibly Armorican, but no precise parallel
	Hampshire				
SU 724029	Hayling Island, 1982, Temple	1 Æ/*Æ*	DLT XIX 6342 (ANDECOMBO)	Inf. D. Nash	Surface finds
		1 Æ/*Æ*	DLT XXXII 8178 (CALETEDOY)		
		1 Æ/*Æ*	Scheers No. 41 (ATEVLA VLATOS)		
SU 639624	Silchester, 1985–6, Forum Basilica	1 *Æ*	Scheers No. 52	Inf. M. Fulford; Boon forthcoming	Excavations
Correction:	Delete 1 *Æ* Gaulish Uncertain from Leicester (Allen, 1960, 282) and see British LX Silver				
			MISCELLANEOUS GAULISH – Bronze		
	Essex				
TQ 6376	Tilbury, 1986	1 Æ	Scheers No. 83	Shown B.M.	See also Coddenham. The type only has one French provenance and may yet prove to be British
	Hampshire				
SU 724029	Hayling Island, 1981, Temple	1 Æ	Northern Gaul DLT XXVIII 7021	Inf. D. Nash	Excavations
		1 Æ	Eastern Gaul DLT XXXIII 8370		
SU 639624	Silchester, 1979–84, Forum Basilica	1 Æ	Scheers No. 80a	Boon 1985, Nos. 35, 37	Excavations. Coin anciently pierced
	Silchester, 1986, Forum Basilica	1 Æ	Southern Gaul DLT VI 2677		Volcae Arecomici

	Hertfordshire				
TL 387236	Braughing, 1971, Ermine Street	1 Æ	Scheers No. 80d	*Herts. Archaeol.* 10, 28-9	Excavations
		1 Æ	New type Cf. Scheers Nos 86–7, 89		
TL 387239	Puckeridge, 1983 or bef., Roundabout	1 Æ	Belgic Gaul? Cf. Scheers No. 65	Index	Obv: face. Rev: animal
TL 389238	Puckeridge, 1983 or bef., opposite Smiths	1 Æ	Scheers No. 145	Index	
		1 Æ	Scheers No. 146		
		1 Æ	Northern Gaul DLT XIX 6088		Carnutes
	Leicestershire				
SK 908172	Leicester, 1936–8, Jewry Wall	1 Æ	Scheers No. 216	Inf. A. Fitzpatrick	Excavations. Not in Allen 1960
	London				
TQ 221781	Chiswick, c. 1980, NE of Chiswick Eyot	1 Æ	Massalia type	Index	See also potin
	Suffolk				
TM 1354	Coddenham, 1980	1 Æ	Scheers No. 83	Shown B.M.	See also Tilbury

MISCELLANEOUS GAULISH – Potin

	Cambridgeshire				
TL 368514	Orwell	1 potin	Tête Diabolique	Index	'Turones'
	Dorset				
SZ 170908	Hengistbury Head, 1919–24	1 potin	Scheers No. 186	Cunliffe 1987, 136–141	
	Essex				
TL 992252	Colchester, 1973–6, Balkerne Lane	1 potin	Uncertain Belgic Gaul?	*Colchester Archaeol. Rep.* 4, 15	Excavations
	Hampshire				
SU 639624	Silchester, 1979-84, Forum Basilica	1 potin	Scheers No. 195	Boon 1985, No. 42	Excavations
	Silchester, 1985, Forum Basilica	1 potin	Uncertain	Inf. M. Fulford; Boon forthcoming	?Boar right

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
SU 4648	Whitchurch, 1988, Willersby Warren	1 potin	Early Massalia imitation	Index; *B.N.J.* 58, 140	British?
	Kent				
TR 1653	Bridge, 1978, Middle Pett Farm	1 potin	Early tête diabolique	*Archaeol. Cantiana* 95, 298, Nos 3–4	The two potins found near here in 1976 are early Massalia imitations, probably Central Gaulish, but possibly British (Ibid. Nos. 1–2)
		1 potin	Scheers No. 186		
TQ 779512	Boughton Monchelsea, 1987, Brishing	1 potin	Scheers No. 190	Inf. D.B. Kelly; *Archaeol. Cantiana* 105, 303	
TR 148576	Canterbury, 1982, Marlowe Theatre	1 potin	Uncertain Belgic Gaul?	Index	Cf. DLT XXXIII 8329
	London				
TQ 2279	Hammersmith, left bank of Thames	1 potin	Early Massalia imitation	Index	Or British copy?
	Norfolk				
TL 9484	Brettenham	1 potin	Early Massalia imitation	*Norfolk Archaeol.* 37 341–3	Or British copy?
TF 687376	Heacham, 1978, 1986	2 potin	Early Massalia imitation	*Norfolk Archaeol.* 37 341–3	Or British copy? For another see Haselgrove 1984, 153
TL 7287	Hockwold cum Wilton, 1986	1 potin	Helvetii Forrer, Fig. 537	*Norfolk Archaeol.* 37 341–3	
	Oxfordshire				
SU 2490	Watchfield, 1983	1 potin	Scheers No. 186	*Germania* 64, 105–38	Excavations. In 6th century AD grave, reused as weight in balance set
	South Yorkshire				
SE 5803	Doncaster area	1 potin	Early Massalia imitation	*B.N.J.* 58, 140	Or British copy?
	Wiltshire				
ST 838385	Brixton Deverill, 1978, Cold Kitchen Hill	1 potin	Tête Diabolique	*W.A.M.* 74–5, 204	
SU 276659	Great Bedwin, 1980, W of Chisbury hillfort	1 potin	DLT XXX 7417	*W.A.M.* 76, 176	
SU 1354	Upavon	1 potin	Early Massalia imitation	Index	Or British copy? Found with British B

CELTIBERIAN

	Wiltshire				
ST 864517	Westbury, 1972, Station Road	1 Æ	Saetabi	*W.A.M.* 68B, 67	1st century BC. Found in a garden. Possibly collector's discard?

UNCERTAIN OR INADEQUATELY RECORDED COINS

	Cheshire				
SJ 2289	Meols, 1863 or bef.	1 A/ or A/¼	–	*Cheshire Archaeol. Bull.* 9, 6–8	Cf. Evans 1864, 120; same coin? See also Armorican
	Dorset				
SZ 170908	Hengistbury Head, 1980–4	2 AR or Æ	Uncertain	Cunliffe 1987, 136-141	Excavations. See also Haselgrove 1984, 153
	Essex				
TL 471125	Harlow, 1985–7, Harlow Temple	3–4 –	Uncertain	Inf. R. Bartlett	Excavations
	Gloucestershire				
SO 836198	Kingsholm, 1983, Gambier Parry Lodge Site	1 –	Uncertain	Inf. P. Garrod	'Celtic coin'
SO 833195	Kingsholm, c. 1983, within fortress area	1 AR	Uncertain		Possible Celtic coin
SU 018945	Somerford Keynes, 1986, Neighbridge	1 Æ/A/?	–	Index	Core of uninscribed stater?
	Hampshire				
SU 724029	Hayling Island, 1981, Temple	1 Æ/A/	Uncertain	Inf. D. Nash	Excavations. British or Gaulish
		1 Æ/A/¼	Uncertain		
		1 potin	Uncertain		Gallic?
		1 Æ/AR	Uncertain		Surface finds. Obv: head left. Rev: boar left. Stylistically Eastern or Central Gaul
		1 Æ/A/¼	Uncertain		Southern British?
		1 Æ/A/	Uncertain		British
		1 Æ	Uncertain		Pierced for suspension. Not definitely Celtic
SU 327376	Nether Wallop, 1984, Danebury Hill	1 Æ	Uncertain	Inf. A. Burnett	Found with other coins including British LZ, O. Core of Æ/A/? Perhaps not a coin
SZ 6399	Portsmouth, 1830	1 AR	Uncertain	*B.N.J.* 50, 1–6	Obv: head right. Rev: horse. See also British LZ silver and Armorican
SU 4829	Winchester, 1974	1 Æ	Uncertain	Index	Excavations

Grid ref.	Provenance	Denom.	Class	Source of information	Notes
	Winchester, 1977	1 Æ	Uncertain		
	Hertfordshire				
TL 252340	Baldock, 1984, Upper Walls Common	1 Æ	Uncertain	Inf. G. Burleigh	Excavations
	Baldock, 1985 or bef., Upper Walls Common	1 Æ	Uncertain		Surface find
TL 250338	Baldock, bef. 1983, Walls Field	1 Æ	Uncertain		Surface find
TL 117079	St Albans, 1982, Gorhambury Villa	1 Æ	Uncertain 'Belgic'	*Britannia* 14, 307; Neal et al. 1990, 110, No. 14	Excavations
	Humberside				
SE 9826	North Ferriby, 1979	1 Æ	Uncertain	Inf. P. Didsbury	Obv: laureate head right. Rev: ?chariot and horses galloping left. Southern tribe?
	North Ferriby, 1982	2 Æ?	–	Inf. P. Didsbury	Corieltauvian?
	Kent				
TQ 758587	Boxley, 1984	1 Æ	Uncertain	*Archaeol. Cantiana* 101, 368	Obv: head left; very worn. See also British potin
TQ 7758	Boxley, 1984	1 Æ	Uncertain		Obv: head left. Rev: bull standing left. See also Gallo-Belgic C
TQ 783593	Boxley, 1984	1 Æ	Uncertain	*Archaeol. Cantiana* 102, 269	Obv: boar right. Rev: horse left. (cf. Harrietsham, below?)
TQ 7759	Boxley, 1987	1 Æ	Uncertain	*Archaeol. Cantiana* 105, 303	Obv: forepart of horse left, X between legs. Rev: boar right
TQ 7376	Cliffe, Wharf Farm	2 Æ	Uncertain	Index	
TQ 7376	Cliffe, 1979	1 Æ?	Uncertain	Noted by author	Or Æ/Æ? Obv: horse right. Excavations
TQ 682694	Cobham, 1984, Cobham Park	1 Æ	Uncertain	*Archaeol. Cantiana* 101, 370	Obv: head left. Small worn coin
TQ 677671	Cobham, 1987	1 Æ	Uncertain	Inf. D.B.Kelly; *Archaeol. Cantiana* 104, 353	Obv: horse or stag? Rev: horse left, running. Illegible legends on both sides
TQ 689579	East Malling	1 Æ	Uncertain	*Archaeol. Cantiana* 105, 303	Obv: horse galloping right, dot and circle above. Rev: horse left?
TQ 5566	Farningham, 1986	1 Æ?	Uncertain	Shown B.M.	Obv: head right. Rev: galloping horse right

TQ 874532	Harrietsham, 1983, Court Lodge Farm	2 Æ	Uncertain	*Archaeol. Cantiana* 101, 370; Index	Obv: boar. Rev: horse (cf. e.g. SA M299 or LY8?); Obv: well formed face
TQ 766562	Maidstone, 1987, Holland Road	1 Æ	Uncertain	*Archaeol. Cantiana* 105, 305	Obv: horse right, head turned to rear
TR 3644	St Margaret at Cliffe, 1884	1 –	–	*J.B.A.A.* 40, 291	Uninscribed British. Not in Allen 1960 etc.
TR 338577	Sandwich, 1987 or bef.	1+ –	–	*Britannia* 19, 484	Iron Age and Roman coins
	Lincolnshire				
SK 9135	Grantham, c. 1965	1 –	–	*Lincs. Hist. Archaeol.* 17, 71	'Celtic coin'
	Northamptonshire				
SP 813598	Little Houghton, 1984, Ten Yards	1 Æ	Uncertain	*Northants. Archaeol.* 20, 147–8	Obv: head right
	Suffolk				
TM 3059	Hacheston, 1984	1 Æ	Uncertain	Index	New type? British?
	Surrey				
SU 902495	Wanborough, 1983–6, Green Lane	68 Æ or Æ	Uncertain	Inf. J.P.C. Kent	See also Epaticcus etc.
	Sussex				
SU 8004	Bosham	1 Æ?	Uncertain	Shown B.M.	Obv: horse right. Rev: animal right. Continental?

Corrections: Delete 1 Æ Southam, Warwicks., (Allen 1960, 285) and see Gallo-Belgic E.
Delete 1 Æ Keevil, Wilts., (Allen 1960, 285) and see Dobunni uninscribed.
Delete 1 Æ Hayling Island Temple (Haselgrove 1984, 153) and see British LZ silver.

The Alimini Survey: The Mesolithic-Neolithic transition in the Salento Peninsula (S.E. Italy)

by SARAH MILLIKEN *and* ROBIN SKEATES†

Introduction

The following report is an account of an intensive field survey carried out by the authors in two localities situated on the edge of the Alimini lakes (Otranto) in south-east Italy, with material dating to the middle Palaeolithic, final Epigravettian/Mesolithic and early Neolithic.

Previous surveys undertaken by De Lorentiis (1968) and Antonio and Francesco Piccinno (1978) revealed the presence of several prehistoric open 'sites' and rock-shelters around the lakes with material ranging chronologically from the Middle Palaeolithic to the Bronze Age. During two weeks in November 1988 the authors relocated and systematically surveyed two of these open 'sites' comprising scatters of lithic and ceramic artefacts: Alimini B (Masseria Paiarone) and Alimini C (Masseria Pagliarone), which were located 1.5 kilometres apart on Pleistocene terraces on the western side of the Alimini Grande lake (Figs. 1 and 2). All of these artefacts are now deposited in Maglie museum.

The Alimini area contains the greatest concentration of surface and ground water in the Salento peninsula. The two lakes, called Alimini Grande and Alimini Piccolo or Fontanelle, lie at present day sea level 2 kilometres inland from the rocky Adriatic coast in two interclusal valleys which cut into Pleistocene terrigeneous skeletal limestones ('Salento calcarenites') in a north-west to south-easterly direction. Alimini Piccolo was originally a closed basin with an impermeable bottom, fed by freshwater springs. However, irrigation works during the early part of the 20th century have considerably altered the original hydrology of the lakes by the creation of two canals, one joining the two lakes, the other running from Alimini Grande to the sea, thus making them both saline (Congedo, 1964).

Methodology

At both localities the lithic and pottery artefacts were found between olive trees on the gently sloping sandy soil surface, with very little grass and weeds. This soil has undergone a number of transformational processes and must clearly be regarded as a disturbed context. For example, it is annually ploughed to a depth of 25 centimetres (its total depth being just

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50 centimetres), and the area around each tree is raked in order to collect the olives. Erosional processes of deflation and slopewash have probably also taken place. The survey was therefore designed to define the overall extent and density of the artefact distributions and to acquire systematic samples of artefacts from each locality.

During initial visits we were able to see where the densest concentrations of artefacts lay. We then imposed a grid over these areas based upon the pattern of olive trees which had been planted at roughly 10 metre intervals (their exact positions were plotted precisely), making 100 m^2 quadrants. The survey area and grid were then extended outwards until no more artefacts were being found. At Alimini C we were not able, in view of the limited time and resources available, to cover the entire area of the artefact distribution so we covered fully the two areas of highest artefact density and joined them by two transects.

In order to avoid sampling problems we covered systematically and intensively the entire area of each grid square and collected all of the artefacts lying on the soil surface. On average two people together in each 100 m^2 quadrant spent twenty minutes collecting artefacts. Finds from each grid square were then bagged and labelled separately. The visibility of the lithic pieces was excellent, especially as it rained intermittently during the survey, and we were able to collect artefacts as small as 3 millimetres in length including minute burin spawls (which are often overlooked on excavations). The pottery on the other hand was difficult to spot due to its small size and colour which matched that of the soil.

We believe that this is the first time in Italy that a Mesolithic or early Neolithic site has been systematically surveyed on the surface with the distribution of the artefacts plotted in detail.

The terminology and typology adopted for the classification of the lithics follows that of Tixier (1963). Therefore the distinction between a blade and bladelet is as follows: a blade is where the length is more than twice the width and more than 5 centimetres and the width is more than 12 millimetres, and a bladelet is where the length is more than twice the width but the length and width are less than 5 centimetres and 12 millimetres respectively.

Alimini B (Masseria Paiarone)

Map and grid reference: 1:25,000 scale IGM 214 I SE Carpignano Salentino 5°59'50''E 40°11'60''N

Alimini B is located on a Pleistocene terrace 12 metres above the level of the lake and 250 metres to the west of the southern end of Alimini Grande (Fig. 1).

The assemblage of lithic artefacts collected from this survey area exhibited a typological and technological homogeneity on the grounds of which they can be attributed chronologically to the final Epigravettian/Mesolithic.

Most of the artefacts were made on an unsourced grey or brown flint. The nearest known flint sources are the Bradano trench 180 kilometres to the north-west and Monte Gargano 300 kilometres to the north. In addition one retouched obsidian bladelet was found. This probably came from the obsidian source on the island of Lipari off the north-east coast of Sicily.

The total area surveyed was 18,600 m^2, and the area of the lithic scatter was 11,600 m^2 (roughly an area of 200 metres in diameter). 3,756 artefacts were collected giving an average density of 3.08 artefacts per m^2. The densest concentration of lithics was found at the western

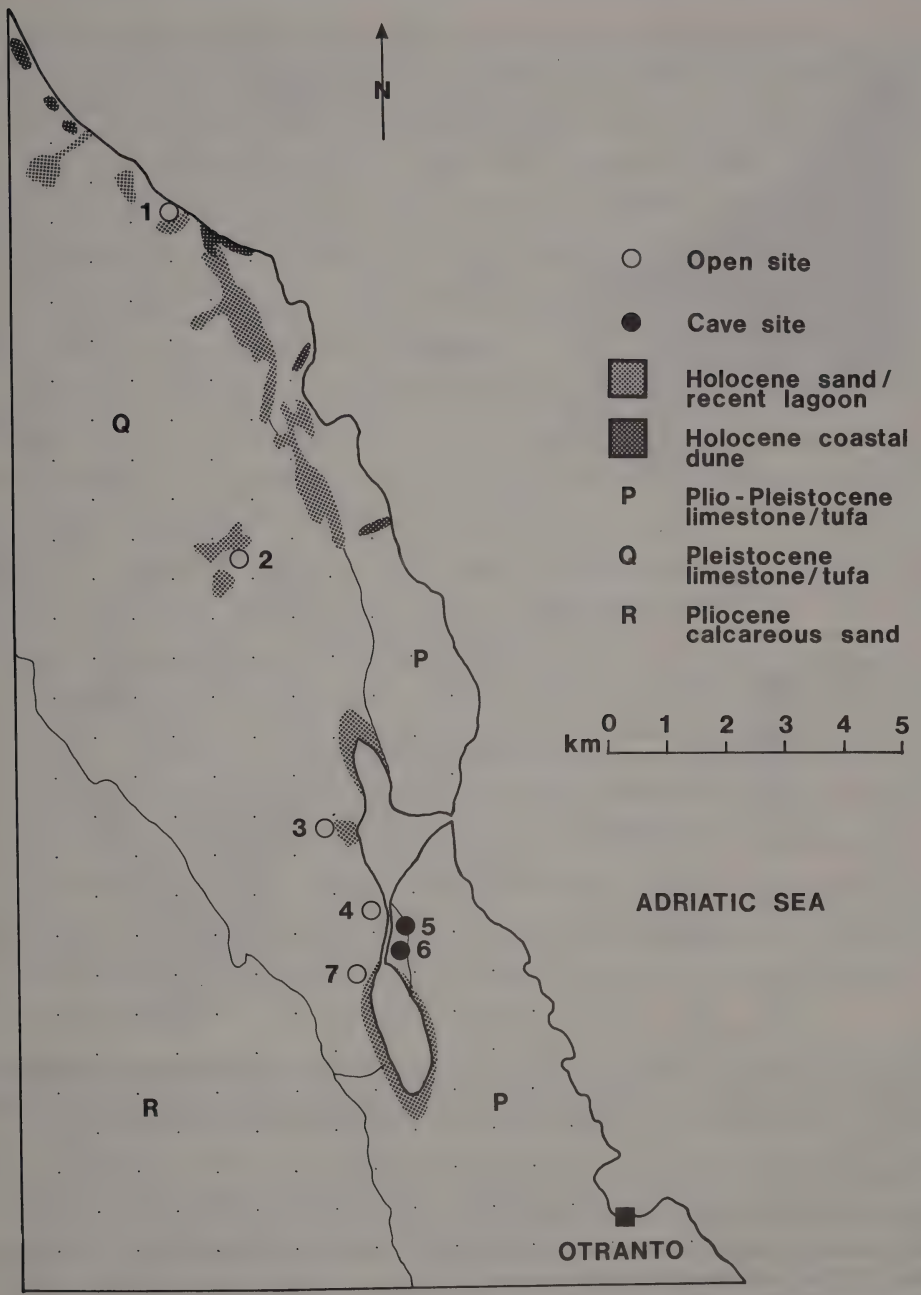

Fig. 1 Geomorphology of the Alimini lakes and site locations (1) San Foca (2) Masseria Malepezza (3) Alimini C (4) Alimini B (5) Grotta Sacara (6) Grotta Marisa (7) Campo Belmonte Domenico.

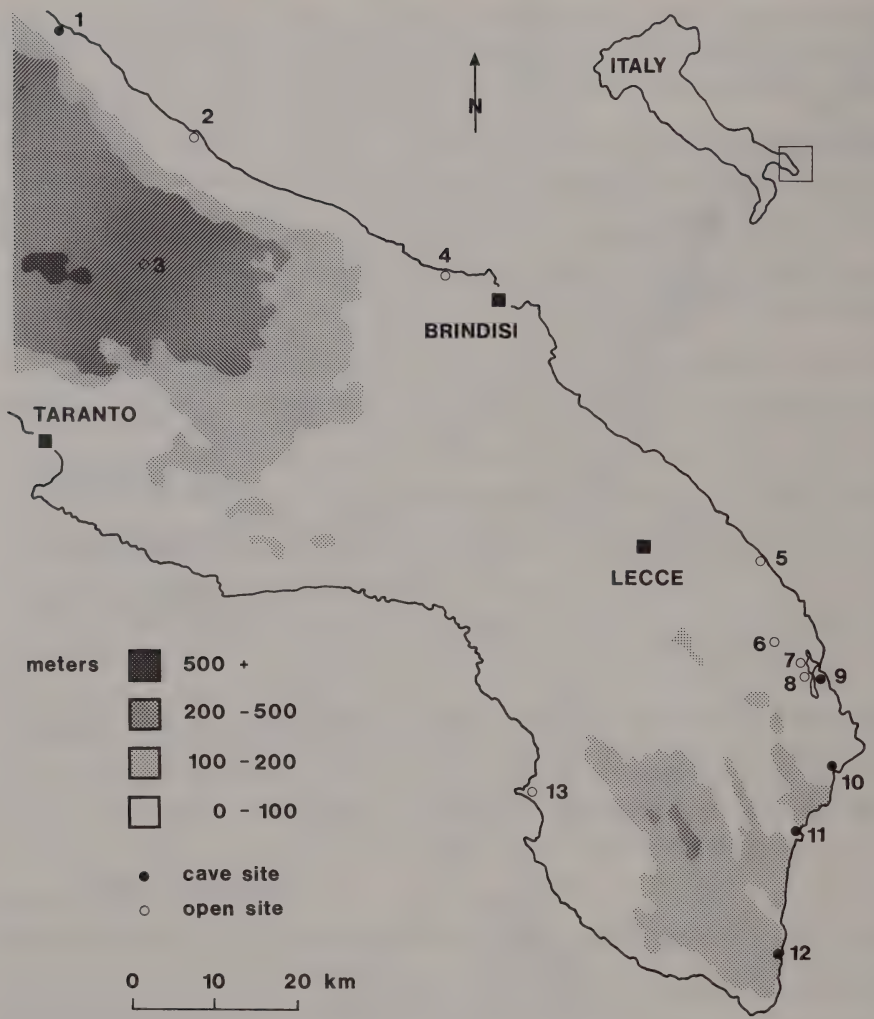

Fig. 2 Map of Salento sites mentioned in the text. (1) Grotta delle Mura (2) Torre Bianca (3) Monticello (4) Torre Testa (5) San Foca (6) Masseria Malepezza (7) Alimini C (8) Alimini B (9) Grotta Marisa (10) Grotta di Porto Badisco (11) Grotta Romanelli (12) Grotta delle Prazziche (13) Torre Sabea

edge of the survey area (Fig. 3), with up to 27 artefacts per m^2. This was bordered and probably cut by a modern track which ran along the top of the terrace slope down to the lake 8 metres below. There was then a fairly regular pattern of fall-off in density around this concentration. It seems justifiable to call this dense concentration of lithics a 'site' as opposed to an 'off-site' area with a continuous low-density spread of material (Foley, 1981). There was no significant spatial patterning of artefact types within the site.

The debitage is strongly dominated by flakes (Table 1), the greater part of which measure

between 0.5 and 1 centimetre in their largest dimension. Bladelets are present (3.5%) and only one blade was found. No large primary flakes with cortex were found, which suggests that the initial stages of the core reduction process took place away from the site. The majority of the cores must be classified as core fragments or unidentifiable which indicates a high degree of core utilization. This, combined with the large number of rejuvenation flakes, could suggest a shortage in the availability of raw material. Among the identifiable cores single platform types predominate, but there is also a notable quantity of opposed platform types, both flake and bladelet (Fig. 4). 36 microburins were collected and several of the backed bladelets exhibited a *piquant trièdre* (microburin scar). The type of retouch on non-backed tools is commonly semi-steep, with flat invasive retouch less frequent. Backed tools outnumber tools with other types of retouch by a ration of 2:1.

The major typological features among the retouched category are the predominance of endscrapers (25.9%) and backed bladelets (18.5%) and the presence of geometrics (1.2%). (Table 1, Fig. 5). The endscrapers show much variability in types. Most frequent are the subcircular and circular endscrapers (Fig. 5: 1–6), but there are also double ended, core-like and nosed endscrapers and endscrapers on a retouched flake. The backed bladelets (18.5%) are mainly obtuse ended and unilaterally retouched though some have a very fine retouch opposite to the backed edge (Fig. 5: 14, 22). There are several pointed backed bladelets, one example with a gibbosity (hump) (Fig. 5: 21), and one shouldered bladelet (Fig. 5: 16) similar to those found at Coppa Nevigata, which are thought to have been used for opening shells (Puglisi, 1955). Of the burins (6.0%), the dihedral type is the most common, followed by polyhedral burins and burins on a concave truncation (Fig. 5: 7, 8). There are also core-like burins, burins on a break, burins on a convex truncation, and burins on a straight truncation. The burin to endscraper ratio is 1:4, but it is more interesting to note the 1:2 ratio of burins to primary burin spawls as this might suggest that the burins were manufactured at Alimini B and some then removed for use elsewhere. There is a strong component of what we have classified as retouched flakes. It is possible that some of these may be broken sidescrapers, but in general they are undistinguished and unstandardised. Composite tools include three endscraper-burins, three sidescraper-burins, and one endscraper-piercer. Notches, piercers, geometrics and points only occur rarely, and no denticulated tools were found. The trapezes are small with a maximum dimension of 1.5 centimetres and are made on triangular bladelets with a concave truncation. The triangles are isosceles.

Alimini C (Masseria Pagliarone)

Map and grid reference: 1:25,000 scale IGM 214 I SE Carpignano Salentino 5°59'00''E 40°12'50''N.

Alimini C is located on a Pleistocene terrace 15 metres above the level of the lake and 500 metres to the west of Alimini Grande (Fig. 1), though during the early Holocene the site would have been situated almost on the lake edge. On the basis of artefact technology and typology and their spatial patterning it is possible to suggest the existence of at least two chronological phases for this survey area: middle Palaeolithic and early Neolithic.

The total area surveyed was 11,776 m^2, and the area of the lithic scatter was 7,360 m^2.

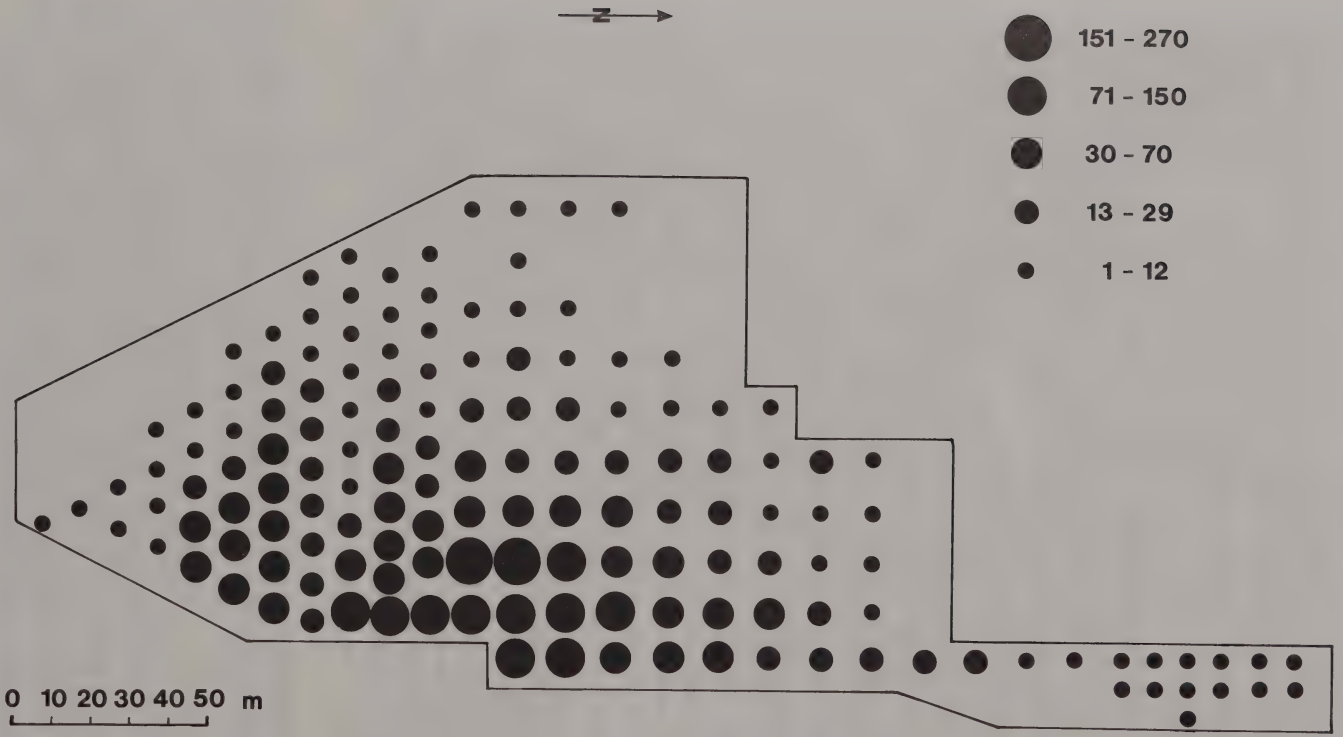

Fig. 3 Lithic density map of Alimini B

18 sherds of pottery and 1,383 lithic artefacts were collected, giving an average density of 5.32 lithics per m^2. Two concentrations of artefacts were defined: one in the north-eastern part of the survey area with a diameter of about 200 metres and an outward fall-off in artefact density; and a smaller one to the south (Fig. 6). Both have a maximum density of 50 lithics per m^2. The former can be classed as a 'site', whereas it is unclear if the smaller concentration to the south is a 'site' or an 'off-site' area.

A distinctive group of relatively large lithic artefacts, with an orange patination and invasive scalar retouch, was found in the eastern half of the survey area, particularly in the south-east (Fig. 7). This included one Levallois core, 6 retouched flakes, 2 of these with prepared platforms, 2 transversal sidescrapers and a point. These artefacts can be confidently assigned to the middle Palaeolithic. Similar artefacts have been found frequently by previous surveys in the Salento. The colour of the soil in this area appeared to be darker than that in the north, and so following the methodology of Keeley and MacPhail (1981) we carried out a simple soil classification study on samples from both areas of Alimini C and also on a sample from Alimini B. The results (Table 3) suggest that the soil from the southern part of Alimini C (with the patinated artefacts) is significantly different from the soils of the northern area and Alimini B, and we believe that it dates to an earlier period.

Of the non-patinated lithic artefacts from Alimini C the debitage is dominated by flakes (Table 2), generally measuring between 0.5 and 2 centimetres in their largest dimension, but there is also a blade component. Cores are abundant and are predominantly for bladelet production (Fig. 8). No blade cores were found. There is a strong presence of microburins (3.3%), including one example with a prepared platform and another on a blade (Fig. 8) Rejuvenation flakes and burin spawls are well represented. There are proportionally less tools with backing, both abrupt and semi-abrupt, than tools with other kinds of retouch.

Typologically the retouched pieces are dominated by endscrapers (23.5%) and retouched flakes (23. 5%), although it is likely that the retouched flakes category includes some broken examples of sidescrapers (as at Alimini B). The endscrapers include a wide range of types: circular and end-of-flake types are the most common, but there are also low quantities of core-like, nosed, and endscrapers on retouched flakes. There is one endscraper on a blade (Fig. 9: 1). The backed bladelets (12.0%) are obtuse ended or pointed, and are normally backed along only one margin, the other sometimes displaying a fine semi-abrupt retouch. *Rabattu* (bipolar) backing is rare. Backed blades (0.9%) and fragments carry abrupt retouch on both margins (Fig. 9: 19–22). There are two examples of rhomboidal snapped blades (Fig. 9: 23–24). Of the burins the dihedral type is the most commonly represented, but there are also rare examples of polyhedral burins, burins on a convex truncation and burins on a break (Fig. 9: 4–6). The burin to endscraper ratio is 1:5. Truncations (5.5%) and notches (4.7%) are present. Composite tools include one endscraper-burin and one sidescraper-burin. Piercers and denticulates are poorly represented, and no points were found. Trapezes are the only type of geometric present. They are abundant (6.0%) and range in size from 1.0 to 2.2 centimetres in their maximum dimension. They are more developed than at Alimini B and are made on both triangular and trapezoidal bladelets (Fig. 9: 7–12). The truncations are either concave (8 examples), straight (4 examples) or concave-convex sinuous (2 examples) (Fig. 8). Microburin scars are present on five of them, absent on six and not observable on three.

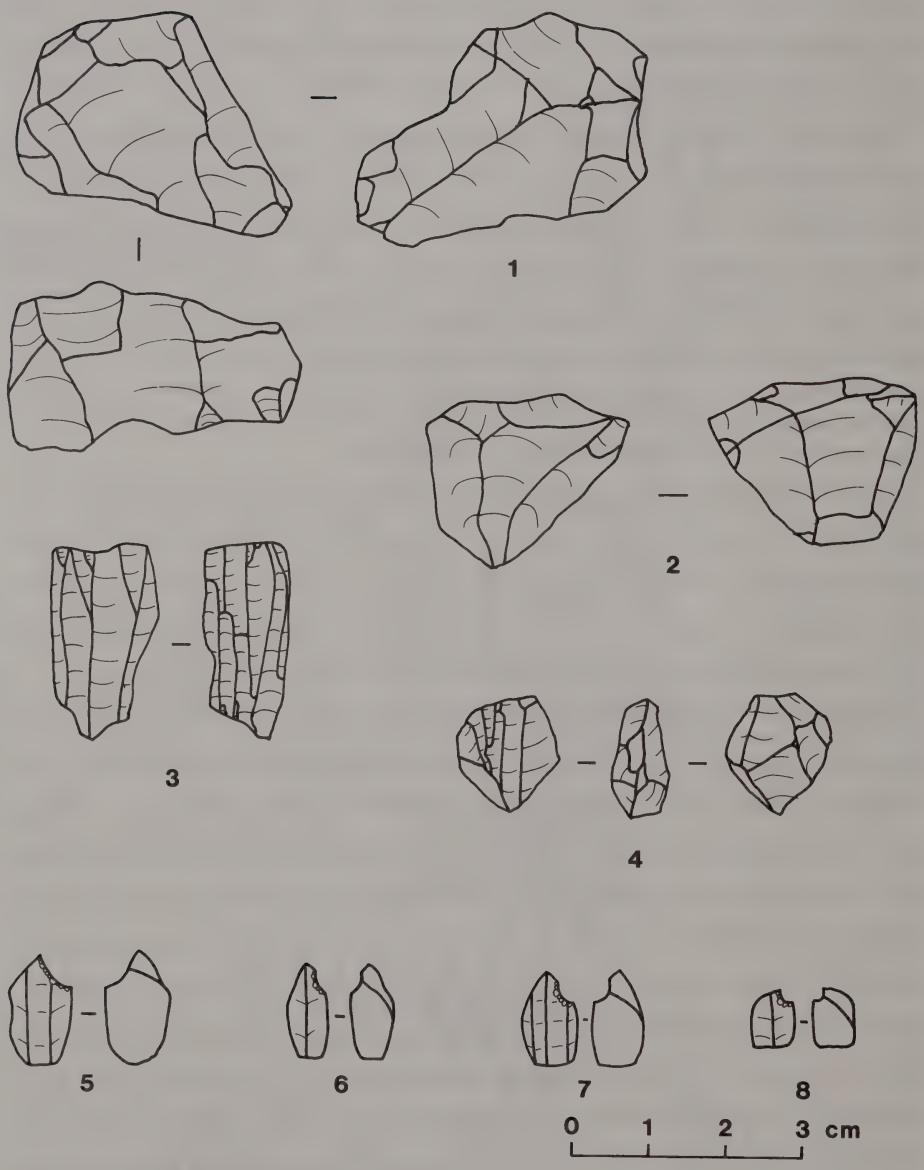

Fig. 4 Cores and microburins from Alimini B. 1–2 flakes cores; 3–4 bladelet cores; 5–8 microburins.

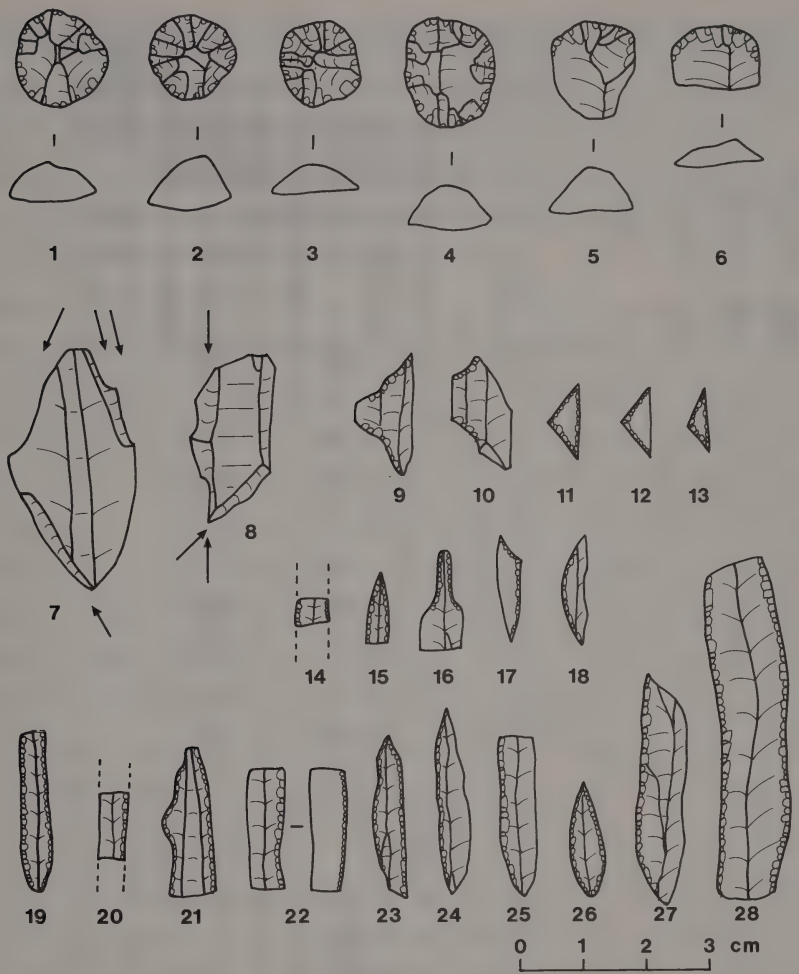

Fig. 5 Tools from Alimini B. 1–4 circular endscrapers; 5–6 subcircular endscrapers; 7–8 polyhedral burins; 9–10 trapezes; 11–13 triangles; 14–27 backed bladelets; 28 backed blade.

All of the eighteen sherds of pottery are featureless, with the exception of one possible lug. The surfaces are generally coloured reddish brown (5YR 5/4) and the cores dark grey (5YR 4/1) according the the Munsell colour classification (Munsell Color Division, 1971). These seem to indicate simple firing conditions, the surfaces suggesting an oxidizing atmosphere during firing, and the dark cores suggesting incomplete oxidization of the pottery either due to a short period of firing or to low firing temperatures (Rice, 1987). The surfaces are all smoothed and one sherd may carry a red slip or paint. Sherd thickness ranges from 2.5 to 11 millimetres with an average of 7.5 millimetres. Set against Moh's Hardness Scale they are all relatively soft: some can be easily scratched with a fingernail and others are slightly harder.

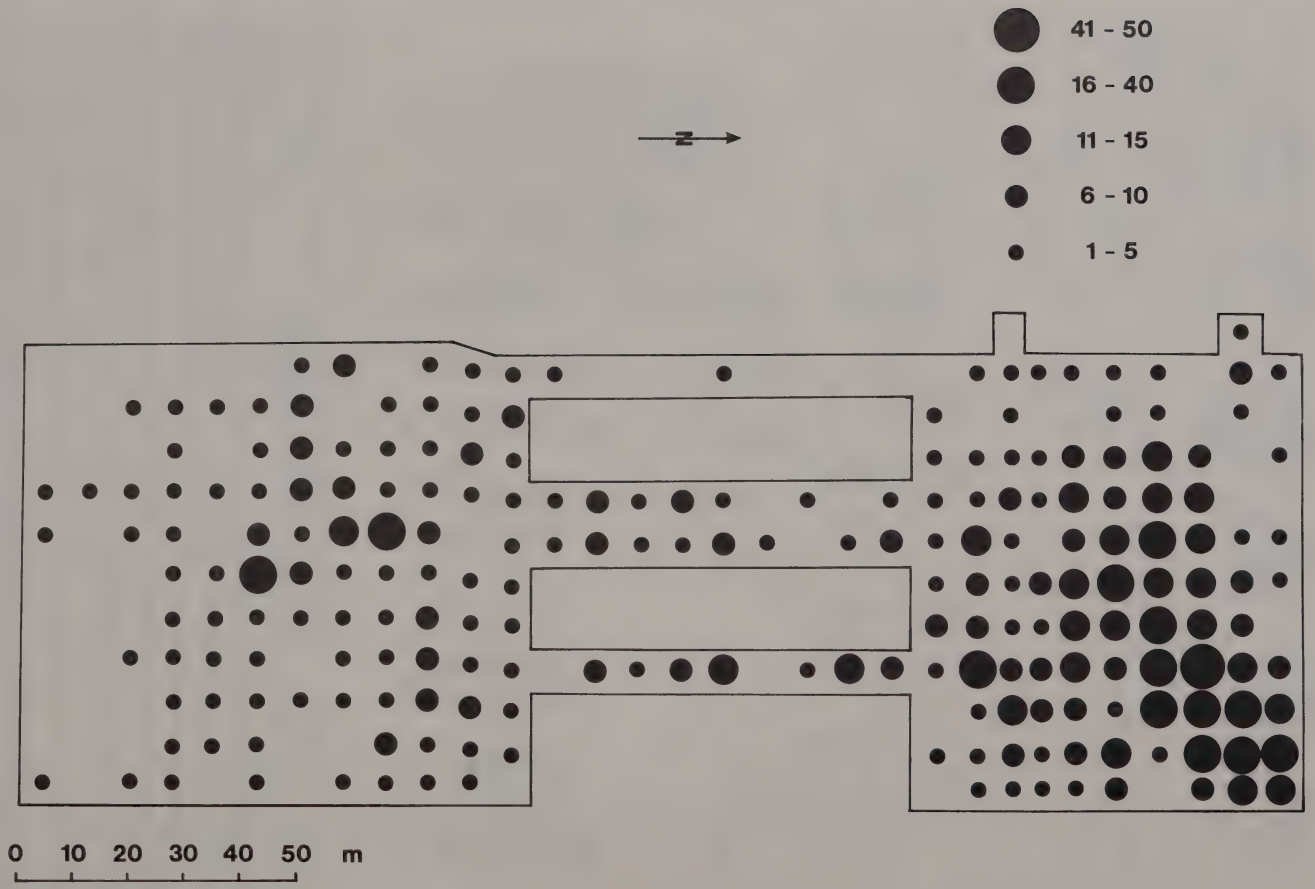

Fig. 6 Lithic density map of Alimini C

They are also highly permeable. Most of the sherds have heavily eroded surfaces and are very small with an average length of 2.3 centimetres. This corresponds with their softness and permeability. The low total number of sherds found at Alimini C might therefore partially be explained by the original ceramics' poor durability against destruction by erosion.

Spatially sherds were found over the whole area of Alimini C; however, nine of them seem to be clustered in the north-western part of the survey area (Fig. 7) and the fabrics of these particular sherds do form a homogeneous group. This corresponds very well with the cluster of five blades in the same area.

Discussion

There are notable similarities bewteen the Alimini B assemblage and material from the recent and currently unpublished excavations by Cremonesi (University of Pisa) in the nearby Grotta Marisa. This small north-facing rockshelter is located less than 200 metres from Alimini B on the western side of the canal joining the two lakes (Fig. 1). It has a semicircular plan with a maximum diameter of 8 metres, a height today of just 1.5 metres, and deposits which range in depth from 0.6 to 1.0 metres. The lithic industry includes a comparably high quantity of backed bladelets and geometric elements, both isosceles and scalene triangles, semilunates and trapezes, as well as many small circular 'Romanellian' endscrapers. The faunal remains are still under study in Pisa, but a preliminary examination revealed the presence of fish, birds and molluscs, including *Nassa*, *Pectunculus* and *Cardium* species, and cervids and bovids (A. Piccinno pers. comm.). Due to the lithic similarities between the two sites and their proximity it is tempting to envisage a similar range of faunal species being exploited at Alimini B.

Another site in this region with a similar lithic assemblage is Torre Testa (Punzi, 1967; Cremonesi, 1967; Cremonesi, 1978), which lies on the coast 7 kilometres north of Brindisi and 70 kilometres north-west of the Alimini lakes (Fig. 2). A site with an assemblage of 26,094 microlithic artefacts was found over an area of 50,000m^2 on a terrace with an altitude of 10 metres above present day sea level. The majority of the lithics measure between 0.5 and 2.0 centimetres in their maximum dimension. The assemblage is dominated by unretouched/technical pieces (91.7%). The cores (1.1%) are either bladelet or single and opposed platform flake types. Microburins are present (n. 74, 0.3%), both ordinary and Krukowski types. Among the retouched category (8.3%) the dominant tool type is the backed bladelet (49.1%), both pointed and obtuse. There are numerous examples with a gibbosity, bipolar backing and truncation. The endscrapers (14.3%) show much variability in type, but are predominantly circular or subcircular. Retouched flakes/sidescrapers are relatively rare (9.8%). Of the burins (2.6%), polyhedral, dihedral and burins on truncation are the most common forms. The burin to endscraper ratio is 1:5. Among the geometrics (1.0%) there are 7 semilunates, 2 triangles (one scalene, the other isoceles), and 7 trapezes. The latter are mainly made on triangular sectioned bladelets with either two straight oblique truncations, or one straight and one concave truncation.

The technological and typological similarities between Torre Testa and Alimini B would seem to suggest a certain degree of contemporaneity. As regards the percentages of the various tool types found the most notable difference between the two sites lies in the higher percentages of endscrapers, burins and retouched flakes/sidescrapers at Alimini B, and the

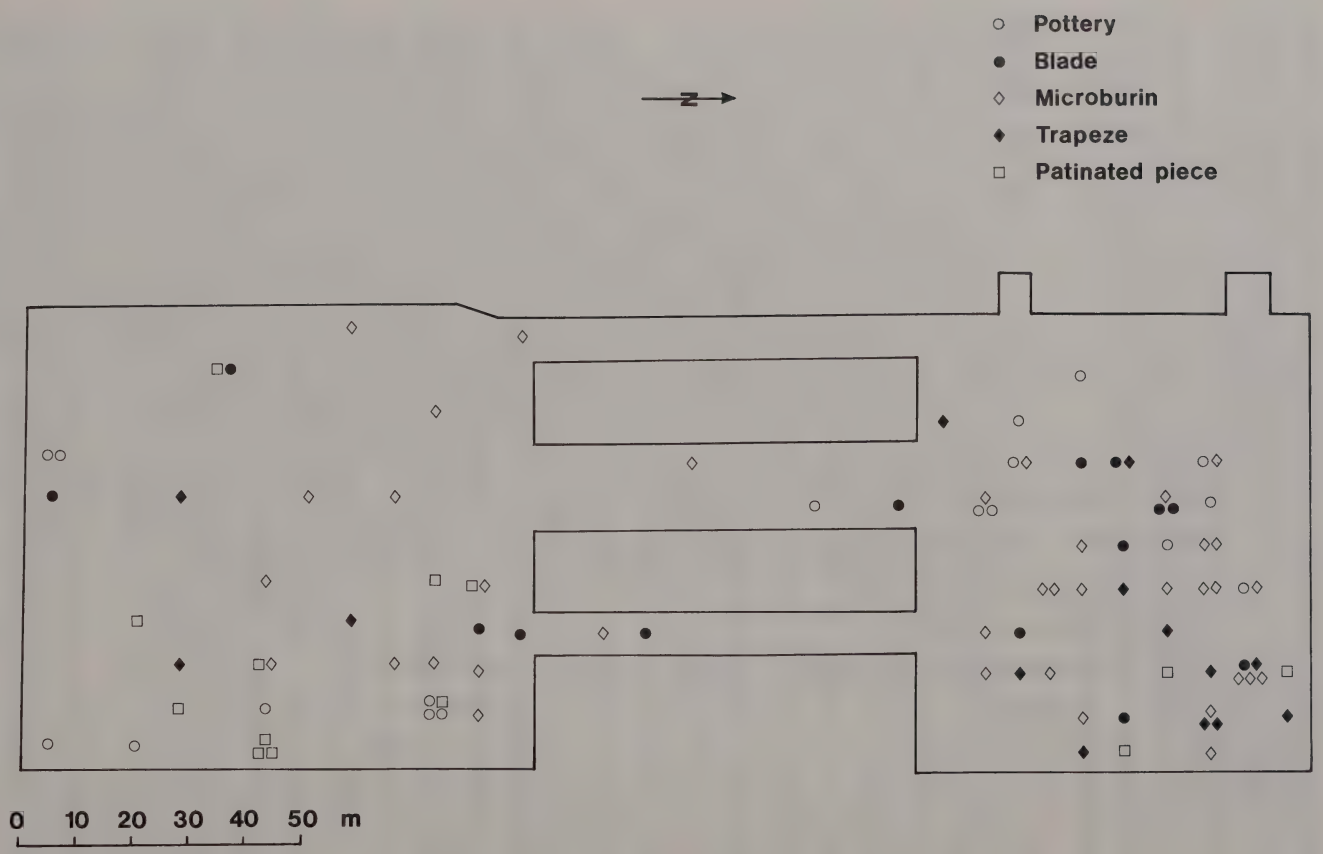

Fig. 7 Distribution of selected artefact types at Alimini C

relative abundance of backed bladelets at Torre Testa. This could be taken to indicate a functional difference between the two sites, such as a greater emphasis on hunting activities at Torre Testa and more domestic activities at Alimini B.

A site with an assemblage of 3,391 artefacts was found at San Foca (Ingravallo, 1980) on the edge of an old lake basin, now filled with Holocene sands and sandy-clays (fig. 1), and located 12 kilometres to the north-west of the Alimini lakes. Again the microlithic aspect of the assemblage, the technological similarities, such as the evidence for bipolar and microburin techniques, and technological similarities in the endscrapers, burins and geometrics place this site chronologically alongside Alimini B and Torre Testa in the final Epigravettian/Mesolithic period. The small quantity of lithic artefacts recovered and the dominance of backed bladelets (35.9%) over endscrapers (12.6%) and burins (4.8%) suggests short term, possibly seasonal, hunting related activities.

Unfortunately there are no radiocarbon dated cave sequences in the Salento region for the final Epigravettian/Mesolithic period with which to corrolate the data from these open sites. The closest radiocarbon dates come from the upper level (A) of the brown earth deposits in Grotta Romanelli located 15 kilometres south of the lakes (Fig. 2). These are 10,320 ± 130 bp (GN-2305), 9880 ± 100 bp (R-54) (Alessio et al., 1965). The assemblage from this level, compared to those underlying it, is characterised by a marked increase in small circular and subcircular endscrapers, and the presence of polyhedral burins, backed bladelets, microburins and rare geometrics, comprising semilunates and triangles (Palma di Cesnola et al., 1983). The presence of trapezes at Alimini B, Torre Testa and San Foca suggests that these sites are more recent in date than Romanelli level A.

Attempts to reconstruct subsistence patterns at Alimini B must be limited due to the total lack of faunal data, with the exception of the unpublished information from the adjacent Grotta Marisa which indicate the exploitation of both terrestrial and lacustrine resources. The shouldered backed bladelet may suggest mollusc exploitation. More generally, the lithics seem to indicate that both domestic and hunting related activities were being carried out, and the lake-side location of the site is surely significant.

The Alimini C assemblage of lithics and pottery probably dates to the early Neolithic, (with the exception of the patinated middle Palaeolithic pieces). At first sight, particularly in the north-eastern part of the survey area, it appeared that there might be an early Neolithic assemblage characterised by blades and simple coarse pottery overlying and partially overlapping a spread of typical final Epigravettian/Mesolithic material including trapezes, microlithic backed baldelets and circular endscrapers. However, the trapezes are typologically more developed than those found in final Epigravettian assemblages, there are less backed tools and there are no triangle or other geometrics, so it seems likely that this is chronologically a relatively homogeneous assemblage. Technological conservatism and the survival of earlier traditions which cut across traditionally defined cultural stages are a recognised feature of central Italian prehistory (Barker, 1981: 111), and these concepts seem applicable to the lithic industries of the Salento peninsula during the early Neolithic period. The sherds are difficult to interpret due to the lack of any clearly diagnostic features, although their spatial association with the blades and the similarity of their fabrics to Neolithic pottery in Maglie museum give a general indication of their date.

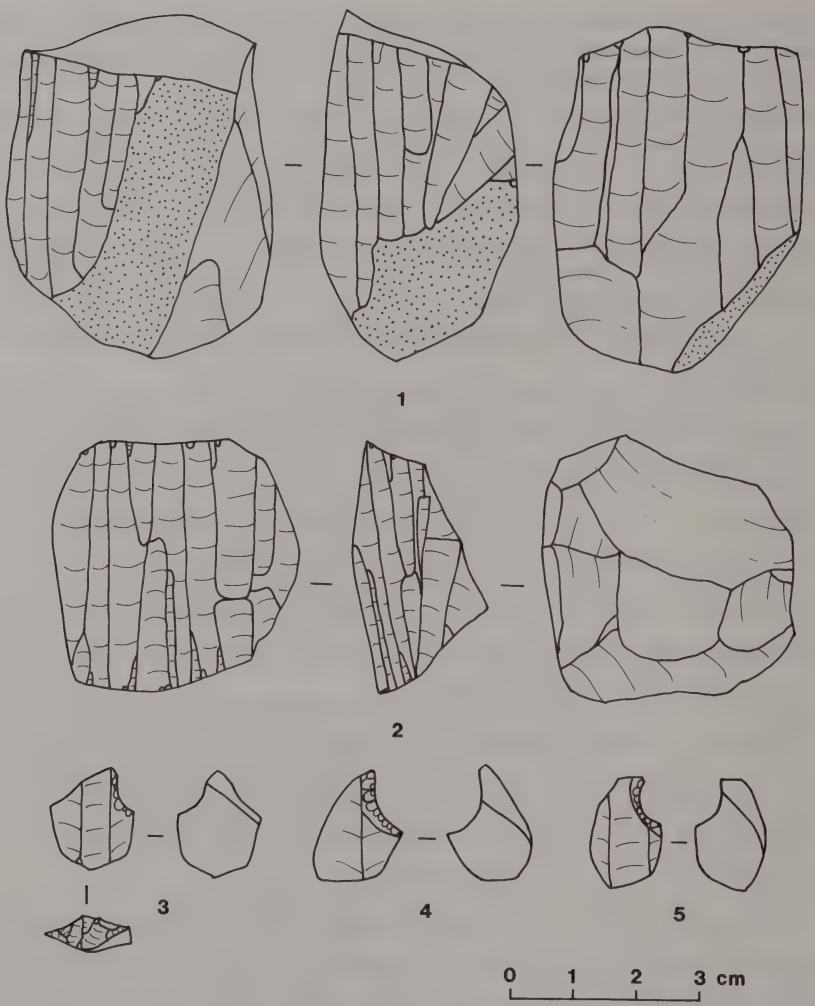

Fig. 8 Cores and microburins from Alimini C. 1–2 bladelet cores; 3–5 microburins.

The assemblage seems likely to be earlier in date than the other two Neolithic sites known from around the Alimini lakes (Piccinno and Piccinno, 1978, and unpublished material in Maglie museum) (Fig. 1). Material from the Grotta Sacara dates to the middle Neolithic with pottery decorated by impressions, incisions, tremolo lines, graffiti, and simple red band and more complex trichrome painting. Obsidian and a greenstone axe were also found. At Campo Belmonte Domenico the pottery included Diana style spool handles, graffiti and finger impressed decoration, and there were many obsidian bladelets and sickle elements, arrowheads, polished stone axes and a 'pintadera' fragment which would suggest a late Neolithic date. It seems likely that if there had been similarly advanced pottery , obsidian or axes present at Alimini C then we would have found at least a few examples of them, considering the

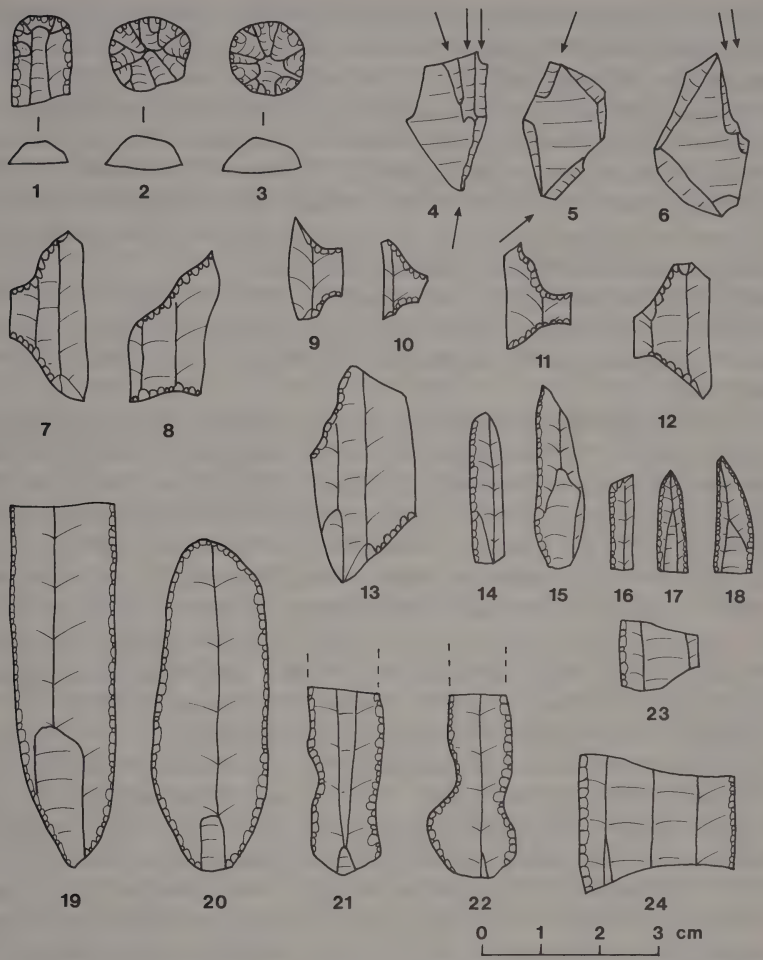

Fig. 9 Tools from Alimini C. 1–3 endscrapers; 4–6 burins; 7–12 trapezes; 13 truncated blade; 17 –18 backed bladelets; 19–22 backed blades; 23–24 snapped blades.

intensive nature of the survey methodology.

A large number of typologically early Neolithic sites are now known in the Salento peninsula (Cremonesi, 1979 and 1983), but only a few of these are published in sufficient detail to make them closely comparable to Alimini C. It does however seem possible to order these chronologically using a modified version of Whitehouse's (1971) scheme.

Phase A is the point of transition between the final Epigravettian/Mesolithic and the early Neolithic. The survey material from Masseria Malepezza at Melendugno (De Lorentiis, 1968, Piccinno and Piccinno, 1974, and unpublished material at Lecce Univeristy) can be placed in this phase. The site lies on the edge of an old lake basin 8 kilometers north-west of the Alimini lakes (Fig. 1). The large sample of 9,355 artefacts is generally similar to that of

Alimini C but also exhibits interesting typological differences which can be interpreted as earlier chronological traits. Triangles and trapezes are present in equally small quantities (0.6%) and there are also semilunates (0.1%). The trapezes are less common than at Alimini C, but exhibit greater stylistic variation, including both classic trapezes made on triangular bladelets and more developed elongated types made on triangular and trapezoidal blades and bladelets. Only the latter type are present at Alimini C. There are also less blades at Masseria Malepezza (2.6%) than at Alimini C (6.1%), although more than at Alimini B (1.0%). Obsidian is present (21 flakes and bladelets), but no pottery was found. (The tanged arrowhead probably dates to a more recent phase of activity at the site).

The assemblage from Monticello, located inland near Martina Franca (Fig. 2), is similar to Masseria Malepezza with what is essentially a final Epigravettian/Mesolithic industry but accompanied by retouched blades, an obsidian blade fragment, semilunates and trapezes (Gambassini, 1969).

Phase B comprises the early Neolithic (Whitehouse's phase 1). In the Grotta delle Mura near Monopoli (Fig. 2) the Neolithic begins in the upper cut of stratum C with a few sherds of coarse impressed pottery, plain burnished figulina and blackish coloured pottery, one obsidian bladelet, a blade, three trapezes, and an otherwise Mesolithic style lithic industry (Cornaggia Castiglioni and Menghi, 1963, Palma di Cesnola, 1987). At Torre Bianca, 500 metres north of Torre Canne, sherds of simple impressed pottery were accompanied by numerous trapezes, triangles, blades and bladelets, obsidian, small greenstone axes and hut plaster (Punzi, 1968); and at Torre Sabea near Gallipoli there was much coarse impressed pottery, some incised and graffiti decorated pottery, along with numerous trapezes, and blades, sickle elements, a smoothed axe fragment and many Mesolithic artefact types (Cremonesi, 1983).

Phase C relates to the middle Neolithic (Whitehouse's phase 2). In the Grotta delle Prazziche near Leuca (Borzatti von Löwenstern, 1969), for example, the earliest Neolithic level B4 contained a more developed range of pottery with coarse impressed ware, plain burnished, graffiti, and bi- and trichrome painted pottery, but a similar lithic industry with blades, trapezes, an obsidian bladelet, and an otherwise Mesolithic style industry.

The Alimini C assemblage can probably be assigned typologically to Phase B: the early Neolithic. However, a note of caution must now be introduced following the example of Coppa Nevigata which, on typological grounds (pottery and lithics) and on the basis of two unreliable radiocarbon dates, was for a long time regarded as the earliest Neolithic site in Italy, but which has now been reliably redated to the early 5th millennium BC (Hedges et al., 1989). The earliest radiocarbon dates for the Neolithic of the Salento peninsula come from the Grotta di Porto Badisco (Fig. 2) : 4515 ± 185 BC (F-97) associated with impressed and painted pottery (Azzi and Gulisano, 1979) and 3900 ± 55 BC (R-1225) associated with simple red band painted pottery (Graziosi, 1980: 120), but these shed little light upon the date of Alimini C or the transition between the Mesolithic and the Neolithic in this region.

It seems more likely that Mesolithic style subsistence activities of hunting gathering and fishing were carried out at Alimini C, with the similarity of its assemblage to Alimini B, its lake-side location, and the absence of potential agricultural tools such as sickle blade and stone axes, although herding of domesticates may have occurred. In the early Neolithic upper cut of stratum C and in stratum B of Grotta delle Mura, marine and terrestrial molluscs were collected, hunting was carried out, and the only domesticated animal was the dog. In the

middle Neolithic stratum B4 of Grotta delle Prazziche mollusc collection and hunting continued, particularly of small animals, and domesticated sheep/goat made up 30–40% of all mammal bones (Whitehouse, 1971). In contrast, at early Neolithic Torre Sabea (Cremonesi, 1983) potential agricultural tools are present, including numerous sickle elements, grindstones and an axe, along with cultivated cereals which included einkorn and emmer wheat and six-row form barley. Sheep/goat made up 50% of animal bones, followed by bovids, then pigs, then hunted animals, especially red and roe deer. Remains of fish and marine molluscs were also found.

Evans (1987: 324–5) questions whether sites such as Coppa Nevigata, Grotta delle Mura and Grotta delle Prazziche represent communities of Mesolithic survivors and prefers to see them as sites used by the Neolithic population in the course of (probably seasonal) gathering and sometimes hunting activities. The Alimini C group could be seen as the successors to the Mesolithic Alimini B group but, with the definition of more likely transitional sites at Masseria Malepezza and Monticello, it is more plausible to regard Alimini C as a specialist Neolithic site belonging to an agricultural settlement such as Torre Sabea.

From our technological study of the Alimini lithic material it is possible to make a few suggestions about acquisition and exchange of raw materials in the Salento peninsula during the period of transition between the Mesolithic and the Neolithic. This approach to communications is of particular interest now that the idea of a coincidence between the first appearance of ceramics, domesticates and navigation in an early Neolithic 'package' has been questioned (Lewthwaite, 1981).

The nearest known flint sources to the Alimini lakes lie 180 and 300 kilometres away, and at Alimini B the high degree of core utilization (cores 1.9%, rejuvenation flakes 2.6%) would seem to reflect the low availability of raw material during the final Epigravettian/Mesolithic. During the transitional phase at Masseria Malepezza there is an increase in the deposition of cores (4.3%) and rejuvenation flakes (8.8%), suggesting an increased availability of raw material, but there is still a high degree of core utilization. However, during the early Neolithic at Alimini C, there is an increase in the deposition of cores (8.7%) and a decrease in the number of rejuvenation flakes (3.8%). This seems to reflect an increased wastage of flint due to a further increase in the supply of raw material to the region and a strengthened and expanded communications network.

Obsidian was also imported into the Salento peninsula, probably originating from the island of Lipari. Some possibly early examples of this material seem to indicate the existence of an inter-regional exchange network in the central Mediterranean well before the first appearance of Neolithic pottery. Such a situation has already been demonstrated in southern Greece, where the late Mesolithic levels at Franchthi cave contained 10% obsidian which had been imported from the island of Melos (Jacobsen, 1976). A truncated obsidian bladelet on display in Maglie museum was found at Grotta Romanelli, where the most recent deposits are Epigravettian in date, and an obsidian unretouched bladelet was found at the final Epigravettian/Mesolithic site of Alimini B. Obsidian is also present at Masseria Malepezza (21 flakes and bladelets) and at Monticello (1 blade fragment) despite the absence of pottery there. During the early Neolithic obsidian exchange became more widespread and small quantities of obsidian are found on many sites.

In the future we hope to carry out further intensive surveys at selected sites in the eastern Salento, followed by excavation, with the aim of improving the chronological definition of the Mesolithic-Neolithic transition in this region of Italy, and investigating lithic exchange networks during this period.

Acknowledgements

The authors would like sincerely to thank: Peppino and Mirella Mileti for their generous hospitality; the landowners Gaetano Cappello and Antonio Giannuzzi; Antonio Piccinno from the University of Lecce; The British School at Rome; and Derek Roe and Ruth Whitehouse for their helpful suggestions.

Abstract

The results and methodology of an intensive field survey around the Alimini lakes in south-east Italy are presented. This work focused on two sites: Alimini B (final Epigravettian/ Mesolithic) and Alimini C (early Neolithic, with a small number of middle Palaeolithic artefacts). The material is compared to similar sites in the Salento peninsula and chronology, subsistence and lithic exchange at the time of the Mesolithic-Neolithic transition are discussed. Plans for future work are outlined.

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Table 1 Lithic type list for Alimini B

Tools (11.08%)	Number	%
Trapeze	2	0.48
Triangle	3	0.72
Semilunate	0	0
Endscraper	108	25.96
Burin	25	6.00
Notch	29	6.97
Retouched flake	74	17.78
Retouched bladelet	4	0.96
Retouched blade	0	0
Truncation	10	2.40
Backed flake	27	6.49
Backed bladelet	77	18.50
Backed bladelet fragment	27	6.49
Backed blade	2	0.48
Backed blade fragment	2	0.48
Composite	7	1.68
Pièce esquillé	5	1.20
Piercer	6	1.44
Sidescraper	4	0.96
Denticulate	0	0
Point	4	0.96
Total	416	100

Unretouched/technical (88.92%)	Number	%
Unretouched flake (whole and fragment)	2930	87.72
Unretouched bladelet	102	3.06
Unretouched bladelet fragment	15	0.45
Unretouched blade	1	0.03
Unretouched blade fragment	0	0
Microburin	36	1.08
Core	62	1.86
Rejuvenation flake	86	2.58
Primary burin spawl	59	1.77
Secondary burin spawl	49	1.47
Total	3340	100
Unretouched obsidian bladelet	1	

Table 2 Lithic type list for Alimini C

Tools (17.07%)	Number	%
Trapeze	14	6.0
Triangle	0	0
Semilunate	0	0
Endscraper	55	23.53
Burin	11	4.72
Notch	11	4.72
Retouched flake	55	23.53
Retouched bladelet	3	1.30
Retouched blade	8	3.43
Truncation	13	5.57
Backed flake	15	6.43
Backed bladelet	28	11.55
Backed bladelet fragment	10	4.13
Backed blade	2	0.84
Backed blade fragment	3	1.30
Composite	2	0.84
Pièce esquillé	2	0.84
Piercer	2	0.84
Sidescraper	0	0
Denticulate	1	0.43
Point	0	0
Total	234	100

Unretouched/technical (82.93%)	Number	%
Unretouched flake (whole and fragment)	884	77.75
Unretouched bladelet (whole and fragment)	13	1.14
Unretouched blade (whole and fragment)	6	0.52
Microburin	38	3.35
Core	99	8.71
Rejuvenation flake	43	3.79
Primary burin spawl	31	2.72
Secondary burin spawl	23	2.02
Total	1137	100

Table 3 Alimini soil classification study

Alimini B	
Matrix colour	5 YR 4/3 reddish brown
Matrix texture	Sand
Matrix consistency	Weak
Coarse components	Absent
Alimini C north	
Matrix colour	5 YR 6/4 light reddish brown
Matrix texture	Sand
Matrix consistency	Weak
Coarse components	Absent
Alimini C south	
Matrix colour	5 YR 5/4 reddish brown
Matrix texture	Silt
Matrix consistency	Loose
Coarse components	1–3 m in diameter, angular, limestone, maximum 1% stones present

The three following papers were delivered at a colloquium on the future of Roman Army studies held at the Institute of Archaeology on Saturday 20th May 1989.

The meeting was held to honour the many contributions to Roman Army Studies over more than sixty years by Eric Birley, Emeritus Professor of Archaeology in the University of Durham. All participants were delighted that, thanks to the generous assistance of R.E. Birley, Professor Birley was able to be present for all the proceedings, making the return journey from Carrun on Hadrian's Wall within a single day. The papers are printed here for the most part as they were delivered and each acknowledges, as was intended, Eric Birley's notable contribution to different aspects of Roman Army Studies.

Work to be done on the Organization of the Roman Army

by M.P. SPEIDEL†

At the 1952 congress of epigraphy in Paris, Eric Birley set forth a catalogue of work to be done on the Roman army. Now, thirty-seven years later, an update may be in order. Nevertheless, Eric's paper still makes great reading, all the more because so much of it has indeed been carried out. He called for work on the senatorial and equestrian officers as well as the centurions: on all three we have now his own studies in his Mavors book. Other work was done by his students. He called for a study of the *primipilares*, now outstandingly done by B. Dobson; the career structure, done by D. Breeze; a study of the functioning of the system from the point of view of the individual soldier, done by G.R. Watson. Besides, Eric himself did the dating of Vegetius' *Epitoma rei militaris* and of the tract *De munitionibus castrorum*, he had called for.

Other scholars worked along the same lines, whether they knew his suggestions or not. R. Saxer did the *vexillationes*, H. Devijver produced his welcome prosopography of the equestrian officers, and Y. Le Bohec has now come out with his volume on the third legion, then dubbed by Eric 'the most profitable of all legions to study'. Although speaking at an epigraphers' congress, Eric rightly asked also for a study of the military papyri and we have now the fine volumes by R.O. Fink, J.F. Gilliam and R. Marichal. Together these works, and many others that have appeared over the years, make up our many-sided knowledge of the Roman army.

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But where is the unifying thread? I believe that we do have such a thread and a clear overall vision in what we are doing, and that this is the past itself, which, of course, is just another way of saying that our sources are rich and clear, that our methods are mostly sound, and that our accounts of the Roman army are informed by our various lives' experience rather than by ideology or outside forces. Still, it behoves us to think about the field as a whole and to plan ahead. Having been called upon—*dilecto lectus*, so to speak—by the organizers of this meeting, let me then list what, as I see it, ought to be done.

First, the sources. Compared to modern historians, we suffer from a dearth of sources. Therefore we have to make sure that all those we have are being used. To be used, they have to be accessible. In his 1952 paper, E. Birley asked for a corpus of military inscriptions. The nearest such thing, then as now, are the two collections by Dessau and Domaszewski, the latter's in *Rangordnung* now usefully enlarged to some 700 texts by B. Dobson. Both, however, are far from being complete, all the more since we have so many new monuments. To mention but three examples: Prof. Balty, not long ago, found at Syrian Apamea some 200 monuments of the third-century field army; a very large batch of gravestone of *legio II Traiana* has come to light at Alexandria in Egypt and is to be published by H. Devijver; and the corpus of the monuments of the *equites singulares Augusti* I have in print has almost 800 items. A checklist of all the military inscriptions, thus would be a major undertaking: the 5000 or so texts, would have to be checked against the best editions or photographs, and their approximate date would have to be established. Still, with electronic handling, it should not be out of reach. The indices alone would offer undreamt-of research possibilities about the units, the soldiers' ranks, their recruitment, servants, marriage, children, ethnic origin, social standing, religion, and so forth.

More readily done are collections by regions or subjects. The regional ones most urgently needed are those for hitherto neglected areas, above all Asia Minor, but also Syria, Egypt, Arabia and, yes, Italy. Such collections, while gathering gravestones, dedications and honorific inscriptions of soldiers, centurions, and veterans, as well as inscriptions set up by army units, might leave aside senatorial and equestrian careers since for these we are better served. They should, however, include photographs, even of uninscribed military reliefs, so as to support the vigorous new research on weapons, dress, and equipment such as done by M.C. Bishop and others. For Northern Italy, Franzoni's book shows how to go about it (if only his pictures were sharper); there is much more to be done still in middle and southern Italy, as well as in overwhelmingly rich Rome, where the praetorian gravestones, especially the ones with reliefs, wait to be published as a corpus with photographs.

Of collections by subjects, the shining examples are Dr. Roxan's volumes of military diplomas. We very much need now a collection of the inscriptions of the auxilia: even without photographs it would be immensely useful for studying the organization as well as the social aspects of the auxilia. Gathering the monuments of the special units of the 'numeri' would likewise be highly useful and would not require a forbiddingly large effort.

'As to the army of the Later Empire, I will only say that its study would be greatly simplified if we could refer to a corpus of inscriptions relating to it.' This 1952 dictum of Eric Birley's is as true today as it was then, and it surely will be a most rewarding task for a scholar to make such a collection. The inscriptions of the later Roman army suffer from greater

neglect than others: many have barely been explained, or altogether wrongly; many languish unpublished; and many are overlooked by scholars because they are published in out-of-the-way places.

Equally useful and rewarding would be a collection of the papyri of the fourth and fifth century army, which often add a great deal to our knowledge. Such a task should not seem forbidding to a non-papyrologist, since the skills needed are above all those for the commentary.

Writing tablets add much that is new and valuable to our understanding of the Roman army. Techniques developed for the outstanding finds at Vindolanda, and the helpful parallel texts of the Vindolanda tablets, should now spur publication of the several hundred tablets from Vindonissa, Winterthur, Carlisle, and elsewhere, some with greatly fascinating letters and accounts.

Coins referring to the army, such as those showing legionary symbols, names of units, standards, soldiers, ships, or Emperors with their troops, would yield much insight if they were collected. Such collections, one of the imperial coins, another of the local ones, would forever be at the fingertips of those studying the army—if they came with sharp photographs and a reliable commentary.

In time such collections may take the shape of electronic data bases of both texts and pictures, greatly strengthening our grip on the material and deepening our researches. Promising progress is now made in Heidelberg under G. Alföldy as his report in the Lausanne Acts shows. Meanwhile, it still pays to gather the monuments in the traditional way and to publish them as books with photographs, so far still our best access to the sources.

Finally, we need an edition, with commentary, of our main literary source, Vegetius. It should above all show how the many pertinent inscriptions and papyri now available, either confirm, illustrate or restrict the statements of this author, thus revealing how he put his work together and making its use safer. The laws of the codes, insofar as they concern the army, need likewise to be collected and given a commentary based mainly on inscriptions and papyri.

As for the methods of study, prosopography of the soldiers did not work well: the distribution of their names over the empire is such that it helps us very little in establishing origin or family relations. Instructive for this is Géza Alföldy's *Nachtrag* in Mavors III to his work on the auxilia of Dalmatia, cutting back on earlier conclusions drawn from names. Even whether a name will tell that its bearer was a Roman citizen or not, has been sharply challenged by A. Móscy—though by way of compensation he has given us the *Nomenclator*, a magic tool when it comes to restoring broken names on inscriptions or papyri.

One method still reigns supreme: if the inscriptions supply parallels for one point, but not for its opposite, that point is proven. This requires much sweat in looking up inscriptions, hence we eagerly await the coming of electronic collections. Let us hope, though, that before long these will include pictures, for surely, transcriptions are not enough and the law must not be broken that a scholar must look up as best he can each inscription he uses. Anyone who has worked with inscriptions knows that in looking at good photographs most discoveries are made and mistakes avoided.

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To come to the main point, what is to be the outcome of our studies? Many articles on a great range of topics are being written all the time. If they are good, they publish sources, marshal data, settle old questions, and open new views. Like sources, however, they need to be collected if they are to be used, for they are widely dispersed in a welter of journals. Besides, the long lifespan of papers on the Roman army makes such collections in our field particularly useful. A beginning has been made with the Mavors series, including, so far, work by G. Alföldy, E. Birley, H. Devijver, J.F. Gilliam and my own; after a lull of some time, the series is now set to flourish further. Many more such volumes are needed, and after some time perhaps a comprehensive index for them, so that the papers and the treasures therein keep circulating.

Research monographs stand for much of the progress in our field. Many are needed. Some topics that will richly repay research, especially if they come with a catalogue of the sources are:

The increasing specialization in fighting skills (the coming of contarii, catafractarii, clibanarii, horse archers, ballistarii, promoti, lanciarii, triarii, etc. even within the legions).

The equites legionis (strength, function, command, careers).

The horse archers (recruitment, training, battle field role).

The beneficiarii (function; careers; income; shape of altars; gods).

The careers of auxiliary decurions and centurions (how many were legionaries, citizens, different in social or ethnic origin from the troopers?).

Discipline and training as the reason for the rise and fall of the Roman army.

Legio II Parthica (origin, the name Severiana, recruitment, functions, weapons training, families, date of the monuments).

The *scholae* of the under-officers (origin and spread, buildings, function, effect, impact on the later Roman army).

The religion of the Roman army (cult of the standards; emperor worship; state gods; native gods, local gods, missionary gods; shrines in the camps and outside; calendar and holidays).

The image of the Roman soldier and officer as a reflection of the Emperor's image (as outlined for officers by K. Fittschen).

A survey of the various provincial armies, such as the *exercitus Moesiacus* or *Syriacus*. What were they called? How were they looked at from Rome? What clout did they have there? How did they differ from each other in name, strength, structure, quality, weapons, equipment and fighting techniques, in recruitment, administration, religion, buildings, fortifications, and in their role in the field army? How was their uniformity maintained? How did they cooperate or even communicate with each other? Some of the answers are found in Tacitus, Suetonius and Vegetius, but the inscriptions and papyri would also tell much.

These are smaller topics. Even if one refers for the study of the higher officers to the inspiration found in the works of G. Alföldy, A. Birley, E. Birley, H. Devijver, W. Eck, H.G. Pflaum, and R. Syme, there are also many mid-sized topics whose study would pay well by widening our knowledge.

We know fairly well from which provinces the legionaries and centurions were recruited. A full study of their social origin, however, is still lacking: did they come from the peasants, the lower, or the upper class in the cities, and how did that change over the centuries? Inscriptions show occasionally that they came from the upper classes, even during the third century when according to Rostovtzeff's thesis the army was the great enemy of the cities. On the other hand, E. Birley has championed the method of looking at careers made by men whose names reveal recent citizenship, and who, therefore, have come from a lowly origin. Or did veterans perhaps *create* the upper classes in the towns and yet kept on sending their sons to serve? The many newly available inscriptions in the series *Inschriften griechischer Städte aus Kleinasien* bid fair to serve as a basis for such a study.

Far more remains to be done in tracing the origin of the auxiliaries. Holder's work covers only the first century, Kraft's only the Rhine and the Danube. Hence a full study of auxiliary recruitment from Augustus to Diocletian throughout the Empire would be a giant step ahead. Here, too, ethnic or geographic origin is easier to assess than social origin, the latter being bound up with the much fought-over citizenship criteria. (In my own opinion, the auxiliaries' names indeed reflect their citizenship, at least in Britain, on the Rhine, and on the upper Danube.)

Rome had not one but many armies. It would be very worthwhile to see how these *exercitus* worked in the setting of their province, to study their origin, recruitment organization, promotions and transfers, their political, social, economic and cultural role in the history of their province, their role in warfare and their impact on the Later Roman army through detachments for the field army. Such projects are feasible because they are local and thus match best the competence and sphere of action of scholars. Recently a number of such studies have come out, and the models are now the two volumes by Le Bohec on the African-Numidian army. Such studies are needed for every province, and for the sake of further work they should present their sources (inscriptions, reliefs, coins etc.) in the form of a catalogue such as only the local specialist can bring together. In provinces with a rich documentation such as Britain, Germany, Pannonia and Egypt these are indeed large undertakings, but Le Bohec has shown it can be done. Considering the great public interest, the high quality and the great bulk of research on the Roman army in Britain, it is indeed odd that there is no full scholarly account of the Roman army in Britain, or for that matter, in either Germany or Pannonia. Egypt has produced so many new documents it would be worth a large part of a scholar's life's work to collect them and to write a new history of the army in Egypt.

When it comes to the history of entire branches of service, the least important one, the fleets, are the best known, especially with the new book by M. Reddé. For the legions the giant work of Ritterling in the Realencyclopädie stands much in need of being updated and work is in progress. Over large stretches Ritterling's text could be left untouched, but if for each of the many points Ritterling made, one could list the sources that have come to light, we would have once more an enormously useful account of the legions.

An equally large undertaking is the needed history of the auxilia. Many of the principles set forth by Cheesman more than seventy years ago, are still valid, but the documentation needs to be wholly redone. The same is true for Cichorius' list of the units. We very much need a survey of the sources for each unit and its history. Being so vast, this task has so far

been beyond the grasp of either single scholars or groups, but its reward would be very great indeed.

The most urgent need, though, when it comes to the branches of service, is a book on the ethnic units, the 'Numeri' as we call them. Here almost everything is still to be done and so much to be learned that such a work would have a major bearing on our understanding of the Roman army. It should treat the size, the recruitment, the pay, the legal status, the staff, and the command of these units, their relation to other auxilia, their origin, their impact on the later Roman army, their disappearance, their fighting techniques and above all their function, which is to say why they were raised in the first place. A whole new chapter in the history of the Roman army could be thus written. To be useful to scholars, however, such a book must present the sources in full, i.e. the inscriptions, reliefs, papyri, fort plans and small finds, etc.

A fair number of books on special topics, written for the general reader as well as for the scholar, have come out these past decades. Many are well written and produced, such as A. Johnson's and D. Baatz' *Römische Kastelle*, and they do us proud. But we have not come up with books on the whole of the Roman army, books that would span the time from Augustus to Augustulus. True, Le Bohec has given us a new introduction to the history of the army of the first three centuries, but what can we recommend, say, to colleagues in neighbouring fields who would like to understand what role the Roman army played in their area of study? No doubt several books on the overall history of the Roman army are needed, based on the primary sources and written for scholars as well as for the reading public, both to give the public a broad range of points of view and to give scholars tools to work with. Here we have failed in a field which ought to engage the minds of the public with grand visions, and which ought to elucidate the five centuries of the Roman Empire as a major epoch in the history of Europe, West Asia, and North Africa.

One such grand vision might result from a study of the army of the third and fourth centuries, when the new field army was raised whose legions and auxilia successfully restored the military might of the empire under Diocletian. We need to know how the legionary detachments were organized for fighting alongside each other, what happened to the *centurio*, the *centuria* and the cohort, and likewise why, in the early fourth century, the new-type Auxilia outstripped the legions in battlefield importance as seen, for example in the prominence of the *Cornuti* on the arch of Constantine. It was these legions whose demise Vegetius lamented, these auxilia that won the battle of Strassburg, and this army that went down in the cataclysm of the battle at Adrianople.

How likely is it that these projects will be carried out? Eric Birley's 1952 programme was so successful mainly because he himself was able to start a school, a group of students working under his guidance. Today, no such school is in sight yet anywhere in the universities of Europe or America. Indeed, considering the all-important role the Roman army played during the first five centuries of our era, Roman army researchers are far too few. We have no established international conferences, no research institutes, no journal of our own, although we can still find grants, publishers and places to work. There is something good, too, in not being a fully fledged discipline, for scholars in the neighbouring fields of archaeology, epigraphy, classics, papyrology and other branches of ancient history often join us, seeing the

promise of work to be done here. Indeed, there is scope here for great research and decisive writing, or as E. Birley said in 1952: there is room for plenty of workers in this field.

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The Geographical Origins of Equestrian Officers

by H. DEVIJVER†

A question that has attracted Eric Birley's special attention is the provincialization of the officer corps of the Roman army. In several papers he has analyzed the problem of the geographical origins of centurions[1] and of equestrian officers,[2] sketched the onomastical and the prosopographical approach, and communicated the results obtained. Thanks to his pioneering work and his continual encouragement, I can now present, in my magister's honour, a first cautious synthesis of the geographical origins of equestrian officers, a study facilitated by the availability now of the *Prosopographia Militiarum Equestrium*.[3]

The immediate cause of the renewed reflection was the recent publication by our friend and colleague G. Alföldy on 'Die Truppenkommandeure in den Militärdiplomen',[4] a study he concludes with an *Anhang*: 'Zur Herkunft der ritterlichen Offiziere des römischen Heeres' (pp. 419–24).

Alföldy's point of departure is the finding that the results given by E. Birley[5] for the equestrian officers who served in Britain are not in harmony with the present writer's observations concerning the tribuni angusticlavii.[6]

Let me clarify. E. Birley examined the equestrian officers who served in Britannia and concluded: 'It is no doubt fair to assume that throughout the first and second centuries Italy provided the lion's share of such officers.'[7] It should be noted, however, that Birley qualified this pronouncement somewhat in its republication in *Mavors* IV, p. 161: 'It is no doubt fair to assume that throughout the first and second centuries Italy provided a high proportion of such officers.' Birley further warns that these results for Britain cannot be extended to the whole of the Roman army and that the Eastern provinces will probably produce a different picture. But more on this anon.

Alföldy[8] proceeds to set Birley's findings opposite those for the tribuni angusticlavii: 'Demgegenüber kam H. Devijver durch die Analyse der Herkunftsangaben für die tribuni angusticlavii zu dem Ergebnis, dass die Ritter provinzialer Herkunft die Italiker zahlenmässig bereits in der Flavierzeit übertrafen: Die Relationen sind im Zeitraum von Augustus bis Caligula 90: 29, unter Claudius und Nero 25: 20, unter den Flavieren 21: 30, im 2. Jahrhundert 117: 143.[9] Hier sind neue Untersuchungen vonnöten.'

I indeed agree with Alföldy that a new study is necessary. May I further add that Alföldy comes to the same result as E. Birley concerning the origins of the equestrian officers cited in the diplomata militaria: 'Ingesamt betrachtet bestätigen die Militärdiplome die weiter oben zitierte Ansicht von E. Birley: Der allmähliche Aufstieg der Provinzialen in die

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Reichsaristokratie ist zwar seit der Flavierzeit unverkennbar, dennoch bildeten die Angehörigen der Obersicht Italiens unter den ritterlichen Offizieren des römischen Heeres zumindest bis in die sechziger Jahre des 2. Jahrhunderts die Mehrheit. In der Periode von 129 bis 156, aus der die zahlreichen exakten Herkunftsangaben vorliegen, ist die Relation zwischen den Italikern und den Provinzialen unter den Hilfstruppenkommandeuren: 12: 6, was mit der Feststellung von E. Birley im Einklang steht, dass die in Britannien bezeugten ritterlichen Offiziere zu 60% Italiker waren.'[10]

In my review of G. Alföldy's *Mavors* volume,[11] which includes the paper just quoted from,[12] I have already posited that the comparisons drawn by Alföldy must be put in their proper context.[13]

(1) E. Birley's findings are confined to Britain. The author is aware that he is working with a limited sample: 'But it must be emphasised that these proportions are not necessarily applicable to the whole Roman army; the equestrian officers in the armies of Cappadocia or Egypt or Syria certainly included more easterners and correspondingly fewer men from the west. But this question really deserves separate discussion.'[14] In two extensive papers I have examined the equestrian officers who came from the Eastern provinces[15] and those that served in the East.[16] The second contribution, that concerning the officers that served in an Oriental province, can be used as reference material for Birley's findings in Britannia.

Let us take a concrete look at the situation in Syria and make a distinction between the officers who held only one militia and those with more than one—more on this distinction below, under item 2. Of the 11 officers who, in the first century, held their only militia in Syria, 7 were from a Greek or Oriental province and 4 from the West.[17] When we consider the careers with more than one militia and with at least one post in Syria/Iudaea-Syria Palestina, two groups can be clearly distinguished: (a) A number of careers are spent exclusively in the East, and it is instructive to note the officer's origo: 16 of 26 are Orientales. (b) Some careers are confined almost exclusively to the East; often more than one rank, or an iteratio of the same rank, is held in the East. Also conspicuous is the combination with a Danube or a Rhine province. The geographical origins of these officers is much more heterogeneous than in the previous group: Italy 7, Spain 2, Gallia Narbonensis 2, Macedonia 1, Africa 3, Eastern provinces 5. Thus only 5 of 20 are from the East (in the preceding group 16 of 26!).[18]

These data not only reveal the differences between the individual provinces, but also show that it is necessary to study career types. One can thus sketch the following picture for the Eastern provinces: The careers with more than one militia but confined to the Oriental provinces belong for 60% to Orientales! In the almost exclusively Eastern careers the presence of Orientales drops to about 34%, and their appearance in the tres/quattuor militiae with a marked geographical mobility—Britain, Rhine, Danube, Africa, the East—amounts to a paltry 8.5%.[19]

(2) I also think it important to isolate the group of officers who performed only one militia. To this group belong the knights who held the legionary tribunate extra ordinem. These were usually members of the municipal elite who had no military ambitions and who

saw in this rather administrative post the acme and the consolidation of their membership in the ordo equester. Returning for this group to the Eastern provinces, we find that of the 82 knights who held their one and only militia in the East, 61 held the legionary tribunate extra ordinem; more than half (48 of 82, or 57%) were Orientales! These are the members of the municipal elite of bouleutai and decuriones who crowned their accession to the equestrian order with this single, rather administrative, militia.[20]

Now this group does not figure in G. Alföldy's sample. For the diplomata militaria mention only praefecti/tribuni cohortis and praefecti alae, never tribuni legionis. Therefore, it seems rather inappropriate to compare the findings for one province (Britannia) and for one type of source (diplomata militaria) with just one rank of the militiae equestres (the tribunatus angusticlavius, scil. legionis).

If the municipal infrastructure was a conditio sine qua non of Romanization, it was the municipal elite that formed the breeding ground and provided the reservoir of the ordo equester. It is quite possible that provincialization proceeded more rapidly among the tribuni angusticlavii legionis, who were mostly recruited from this elite[21] and who, as has already been noted above, were quite content with this one and only militia. To be more specific: for the period Claudius/Nero Alföldy lists 5 praefecti from the diplomata militaria, all presumably of Italian provenance. Let us now take, at random, some tribuni angusticlavii from the same period, confining ourselves to the Tib. Claudii from the Greek part of the Roman empire: Pros. Mil. Eq. I, C124 (Ephesus, Asia), C130 (Miletus, Asia), C134 (Cos, Asia), C138 (Magnesia, Asia), C139 (Corinthus, Achaia), C166 (Cos, Asia) (see now also Pros. Mil. Eq. IV, 1987, C124, C130, C134, C138, C139, C166). Thus an examination restricted to the tribuni angusticlavii yields a wholly different picture. One of my pupils has made a study of the nationalities of the equestrian officers, but split up according to the rank attained. She has found that the provincialization proceeded more rapidly among the officers whose careers were confined to the tribunate. From the middle of the first century AD the Italici were in the minority. In the command of the cohortes the provincials only broke through at the outset of the second century. In the group that traversed the full tres militiae the Italici are visible the longest; during the whole second century they continue to provide about half of the officer corps.[22]

(3) Although the geographical origins of the equestrian officers must be nuanced per province, per area (Italy, the West, the Greek East), per rank of the militiae, in the end the problem of an overall approach must be posed. Can a general picture be drawn of the geographical origins of the equestrian officers?

Two fundamental considerations must be made preliminarily. First of all, only in an extremely limited number of cases do equestrian officers themselves indicate their origo;[23] so how are we to determine the provenance of the vast majority with any certainty? Secondly, what is the value of our sample, in other words, is our evidence sufficiently representative for an overall picture of the geographical origins of the equestrian officers? Can we draw generally valid conclusions from these limited data?

At present some 2100 equestrian officers are known;[24] these represent about 4% of the theoretical numbers that could have been in the militiae in the period between Augustus (27 BC) and Gallienus (268 AD).[25] For only 110 officers do the sources themselves mention the origo,[26] 8 of these being uncertain; so, of all the officers known to us, the origo is mentioned explicitly for a mere 5%! This means that of the total theoretical number of militiae ever held, the origo of the officer is known for only 0.22%!

The criteria employed to determine the geographical origins of the equestrian officers for whom no origo is explicitly cited in the sources are numerous and sufficiently well-known: onomastic data, tribus indication, mention of municipal functions, prosopographical information and family ties, etc. It should be noted that a single criterion is seldom decisive and that, usually, several elements have to point in the same direction ('akkumulative Evidenz') before a proposal of origo for a given officer can be advanced. Often the amount of available information is insufficient; thus, of the ca. 2100 known equestrian officers, an origo can be suggested for just 1312,[27] i.e. about 62.5%.

Alföldy, on the basis of the diplomata militaria, worked with an extremely limited sample of ca. 120 attestations of equestrian officers to tackle the problem of their geographical origins.[28] He believes that the diplomata militaria are very well-suited to a discussion of this question. First of all, these sources are dated very precisely and distributed evenly over the various periods. Secondly, in the diplomas of 129 to 156 the commander's origo is indicated quite specifically. Thirdly, and here I quote, 'Wir brauchen bei der Untersuchung der Diplome nicht wie bei der Auswertung der übrigen inschriftlichen Quellen damit zu rechnen, daß die ungleiche Verteilung des Quellenmaterials in den verschiedenen Teilen des Imperium Romanum die 'statistischen' Schlüsse verfälscht, indem wir z.B. aus den inschriftenreichen afrikanischen Provinzen schon infolge der Quellenlage mehr Ritter kennen als etwa aus den eher inschriftenarmen Tres Galliae: Welche Herkunftsangaben durch die Militärdiplome bezeugt sind und welche nicht, hängt nicht von der Häufigkeit oder Seltenheit der Diplome in den einzelnen Reichsteilen ab.'[28a]

I can largely endorse Alföldy's argumentation. But I do believe that my sample of 4%—as opposed to Alföldy's 0.24%—provides a broader base for an overall approach. In the theory of probability it is a generally accepted fact that when the number of the unknowns increases the known percentages gain in importance. For the larger group one is discussing, the greater the chance of systematization. When a certain system is in force, the constants and the variables can be drawn even with very limited percentages.

But the representativeness of our evidence can be viewed from yet another angle: Who received, e.g., an inscription? Who had the best chance of epigraphic survival? In other words, is there a discrepancy between attestations of officers who held only a lower rank, and the group that advanced to the senior ranks and the higher procuratelae and praefecturae or the select group of the adlecti in amplissimum ordinem? Was epigraphic survival tied to the level one had reached on the military and administrative ladder?

Another factor that could influence the attestation of an equestrian officer was the number of posts available within a given rank. Thus we have to take into account the pyramidal structure of the militiae equestres. E. Birley[29] has calculated the number of positions available

per rank around the middle of the second century and arrived at the following numbers: militia I: 270 (praefecti cohortis quingenariae/ tribuni cohortis quingenariae voluntariorum); militia II: 180, (tribuni angusticlavii legionis/tribuni cohortis milliariae); militia III: 90 (praefecti alae quingenariae); militia IV: 9 (praefecti alae milliariae). Is our epigraphical and papyrological evidence a representative reflection of this situation? P.A. Brunt[30] has offered the following objections: 'Now if epigraphic records preserve a fair sample of all who ever held all these commissions, we should have at least 27 prefects of cohorts for every 18 tribunes of legions or cohorts and 10 prefects of alae; i.e. in the ratio: 100 : 67 : 37. But this is not what we find. I went through 300 successive names in H. Devijver, *Prosopographia Militiarum Equestrium*, L1–S12, omitting instances of dubious supplementation, and 10 in which the men are simply said to have performed the equestrian military offices or to have been a militiis without further specification, not counting more than once as tribune or prefect anyone who held those commissions more than once, and excluding (i) tribuni a populo, in case that office was sometimes purely honorary, (ii) certain future senators conjecturally regarded as angusticlavii, and (iii) tribunes of the cohorts at Rome, but not confining the count to cursus inscriptions, and I found that the ratio was 100 : 160 (tribunes) : 80 (cavalry prefects). The most junior post is thus notably under-represented, and the 'praestantior ordo tribuni' (Statius, Silv. VI 97) over-represented.'

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* *

Despite the foregoing methodological reflections, nuances and restrictions, an overall survey of the geographical origins of the militiae equestres can be enlightening. Although the buildup of the ordo equester is much more heterogeneous than that of the ordo senatorius, the knights present a clear social profile. This was certainly the case for that group of equestrians that left their municipium to take part in the central administration of the empire as military officers and civil servants (militiae equestres and procuratelae). A general overview therefore seems justified.

The first five tables offer a chronological survey of the available evidence. Table 6 presents, for the sake of completeness, the cases that cannot be exactly dated.

Table 1. From Augustus to the 'Four-Emperor-year'

	Augustus	Tiberius	Caligula	Claudius	Nero	Galba–Otho–Vitellius	ineunte I s.	medio I s.	I parte I s.	ante Flavios	summa	summa	summa
Italia	92	31	3	21	22	7	7	4	69	21	277	277	277
Sicilia	2	–	–	–	1	–	–	–	–	–	3	3	
Narbonensis	6	4	1	4	1	–	2	1	4	1	24		
Aquitania	–	–	–	–	–	–	–	–	1	–	1		
Belgica	2	1	–	1	1	3	–	–	–	–	8	33	
Germaniae	2	1	–	1	1	–	–	–	–	–	5	5	
Dalmatia	1	–	–	–	–	–	–	–	–	–	1	1	
Tarraconensis	4	–	–	1	3	1	–	1	1	2	13		
Baetica	3	1	–	1	2	1	–	1	1	–	10		
Lusitania	–	–	–	–	–	–	–	–	2	–	2	25	
Africa Procons.	–	1	–	1	–	–	–	–	–	–	2		
Mauretania	–	–	–	1	–	–	–	–	–	–	1	3	
Occidentalis	–	–	–	1	–	–	–	–	–	–	1	1	71
Thracia	–	–	–	–	1	–	–	–	–	–	1		
Macedonia	–	–	–	–	1	–	–	–	1	1	3		
Achaia	–	–	–	1	2	–	–	–	–	–	3	7	
Asia	5	–	2	9	3	1	–	–	–	–	20		
Pisidia	1	2	1	–	2	1	–	–	1	1	9		
Galatia	–	–	–	1	–	–	–	–	–	–	1		
Lycia	–	–	–	1	–	–	–	–	–	–	1		
Bithynia	–	–	–	–	1	–	–	–	–	–	1		
Syria	1	–	–	–	1	–	–	–	–	–	2	34	
Orientalis	2	–	–	2	–	1	–	1	–	–	6	6	47

a) Before the Flavian emperors Italy provided the lion's share of equestrian officers: 277 as opposed to 118 from the provinces (71 Occidentales, 47 Orientales).

b) In the West the contribution of Narbonensis (24) and of Spain (25) is conspicuous, together 49 of 71 Occidentales. For the East there is a strong contingent from Asia and Pisidia: 29 of 47 Orientales.

c) Under the emperor Claudius we find the following situation: Italy 21, provincials 25 (among the latter 11 Occidentales, 14 Orientales—9 from Asia).

Table 2. From Vespasian to Nerva

	Vespasianus	Domitianus	Flavii	Nerva	II parte I s.	summa	summa	summa	I s.	
Italia	16	22	5	2	6	51	51	51	41	41
Narbonensis	3	3	2	–	3	11			5	
Belgica	1	–	–	–	–	1			1	
Germania Inf.	2	–	–	–	–	2			–	
Dalmatia	–	–	–	–	2	2	16		3	
Tarraconensis	8	5	2	–	2	17			2	
Baetica	–	1	1	–	–	2	19		–	
Africa Procons.	–	–	–	–	–	–			–	
Tripolitania	–	–	–	–	–	–			1	
Mauretania	1	–	–	–	–	1	1		–	
Occidentalis	3	3	–	–	1	7	7	43	–	12
Thracia	–	–	1	–	–	1			–	
Macedonia	–	–	–	–	–	–			2	
Achaia	1	–	1	1	–	3	4		–	
Asia	3	2	–	1	–	6			1	
Pisidia	1	2	–	–	–	3			2	
Galatia	–	–	–	–	–	–			–	
Lycia	1	1	–	–	–	2	11		–	
Orientalis	3	–	–	–	–	3	3	18	1	6

a) Under the Flavii Italy apparently loses its preferential position: 51 Italians as opposed to 61 provincials (43 Occidentales, 18 Orientales).

b) In the West the trend from the preceding period continues: Narbonensis (11) and Spain (19) remain the most important suppliers: together 30 of 43 Occidentales!

c) Likewise in the East Asia and Pisidia (9 in all) are still best represented.

Table 3. From Trajan to Antoninus Pius

	Traianus	Trai./Hadr.	Hadrianus	Anton. Pius	exeunte I s.	ex. I s./ineunte II s.	ineunte II s.	I parte II s.	medio II s.	summa	summa	summa
Italia	35	3	25	23	3	5	2	6	5	107	107	107
Sardinia	-	1	-	-	-	-	-	-	-	1		
Narbonensis	4	-	2	-	3	5	-	1	1	16		
Aquitania	1	-	-	-	-	1	-	-	-	2		
Lugdunensis	-	-	-	-	1	-	-	-	-	1		
Dalmatia	1	-	-	-	-	1	-	-	-	2		
Moesia Sup.	-	-	-	-	-	-	-	-	1	1		
Noricum	1	1	1	1	-	-	-	1	-	5		
Raetia	-	-	-	-	-	-	-	-	-	1		
Pannonia Sup.	-	-	-	1	-	-	-	-	-	1		
Dacia	-	-	1	1	-	-	-	-	-	2	32	
Tarraconensis	7	1	3	-	-	8	1	2	1	23		
Baetica	1	1	2	1	-	-	-	-	1	6	29	
Africa	4	1	3	4	-	1	-	2	-	15		
Mauret. Caes.	1	-	1	-	-	2	-	-	2	6		
Mauret. Ting.	-	-	-	1	-	-	-	-	1	2		
Numidia	-	-	3	5	-	2	-	-	-	10	33	
Occidentalis	5	1	3	7	-	1	1	-	2	20	20	114
Macedonia	1	-	-	1	-	-	-	-	-	2		
Achaia	2	-	2	-	1	-	-	-	-	5	7	
Asia	4	1	4	7	1	-	-	-	1	18		
Pisidia	1	-	-	1	-	-	-	-	1	3		
Galatia	-	1	-	1	-	-	-	-	-	2		
Lycia	2	1	2	2	-	-	-	-	-	7		
Bithynia	-	1	-	-	-	-	-	-	-	1		
Iudaea	-	1	-	-	-	-	-	-	-	1		
Syria	1	1	2	3	-	-	-	3	2	12		
Aegyptus	1	-	9	2	-	-	-	-	-	12	56	
Orientalis	-	-	3	-	-	-	-	-	-	3	3	66

a) Italy's presence decreases further: 107 Italici as opposed to 180 provincials (114 Occidentales, 66 Orientales).

b) In the West, Narbonensis (16) and the Spains (29) are still strongly represented. For the first time there is a sizable contingent from Africa: 33! The mosaic of the Western provinces becomes more variegated; the Danube provinces, for instance, now appear, albeit modestly.

c) Asia and Pisidia still supply 21 officers, i.e. one third of the Orientales. Here in the East as well, the number of participating provinces increases: Syria (12), Egypt (12). (As for Egypt, I have already elsewhere emphasized the role of that cosmopolitan Philhellene, Hadrian.[31])

Table 4. From Marcus Aurelius to Septimius Severus

	Marc. Aurel.	Commodus	Sept. Severus	II parte II s.	exeunte II s.	summa	summa	summa	II s.	
Italia	13	8	10	8	6	45	45	45	55	55
Sicilia	–	–	–	–	–	–			1	
Sardinia	–	–	1	–	–	1			1	
Corsica	–	–	–	–	–	–	1		2	
Narbonensis	1	1	–	1	–	3			3	
Britannia	–	–	1	–	–	1			–	
Germania Inf.	–	1	–	–	–	1			–	
Germania Sup.	–	–	1	–	–	1			1	
Dalmatia	–	1	–	–	1	2			2	
Moesia Sup.	–	–	–	–	–	–			1	
Noricum	1	–	–	–	–	1			1	
Pannonia Inf.	–	1	–	–	–	1			–	
Pannonia Sup.	–	–	2	–	–	2			–	
Dacia	2	–	1	1	–	4	16		–	
Tarraconensis	1	–	1	1	–	3			1	
Baetica	–	–	–	2	–	2			3	
Lusitania	–	–	–	–	–	–	5		1	
Africa	4	2	4	1	–	11			10	
Numidia	2	2	2	–	1	7			10	
Mauret. Caes.	–	1	1	3	1	6	24		2	
Occidentalis	5	2	7	4	–	18	18	64	10	49
Achaia	1	–	–	–	–	1	1		–	
Asia	1	–	3	2	–	6	–		8	
Pisidia	–	–	–	–	1	1			–	
Galatia	1	–	2	–	–	3			1	
Lycia	–	1	1	–	–	2			4	
Bithynia	–	–	2	–	–	2			2	
Syria	1	1	4	1	–	7			2	
Aegyptus	–	1	–	–	–	1			–	
Arabia	–	–	–	–	–	–	22		1	
Orientalis	1	2	4	–	–	7	7	30	1	19

a) Italy's decline continues: 45 Italici as opposed to 64 Occidentales and 30 Orientales!

b) In the West, Narbonensis (3) and Spain (5) have played out their role. The Africans (24) have taken their place. The contribution of the Danube provinces becomes more marked.

c) In the East, Asia continues to supply officers, but Syria now equals it.

Table 5. From Caracalla to Gallienus

	Caracella	Heliogabalus	Alex. Sev.	Gord. I/III	Philippus	Val./Gallienus	ex. II s./in. III s.	ineunte III s.	I parte III s.	medio III s.	summa	summa	summa	III s.	
Italia	3	3	2	4	–	1	7	1	2	3	26	26	26	15	15
Narbonensis	–	–	–	–	–	–	–	1	–	–	1			1	
Lugdunensis	–	–	–	–	–	–	–	–	–	–	–			1	
Germania Inf.	–	1	–	–	–	–	–	–	–	–	1			2	
Britannia	1	–	–	–	–	–	–	–	–	–	1			–	
Raetia	–	1	1	–	–	–	–	–	–	–	2			–	
Noricum	–	–	–	–	–	1	–	–	–	–	1			4	
Dalmatia	1	–	–	–	–	1	–	–	–	–	2			1	
Pannonia Sup.	–	–	–	–	–	–	–	–	1	–	1			3	
Pannonia Inf.	–	–	–	–	–	–	–	–	–	–	–			2	
Moesia Sup.	–	–	–	–	–	–	–	–	–	–	–			1	
Moesia Inf.	–	–	–	–	–	–	1	–	–	–	1			1	
Dacia	–	–	–	–	–	1	–	–	–	3	4	14		4	
Tarraconensis	2	2	1	–	–	–	–	–	–	–	5	5		–	
Africa	2	2	2	3	–	–	3	1	1	–	14			8	
Mauret. Caes.	–	–	–	–	1	2	1	–	–	1	5			8	
Numidia	–	1	1	–	1	–	2	1	1	1	8	27		4	
Occidentalis	4	5	–	3	1	1	–	–	–	–	14	14	60	10	50
Thracia	–	–	–	–	–	–	–	–	–	–	–			1	
Macedonia	1	–	1	–	–	–	–	–	1	1	4			1	
Achaia	–	–	–	–	–	–	1	–	–	–	1	5		–	
Asia	2	–	1	1	–	–	–	1	1	–	6			6	
Lycia	–	–	–	–	1	–	1	–	–	1	3			–	
Bithynia	–	–	–	1	–	–	–	–	1	1	3			2	
Syria	–	–	1	–	–	1	2	–	–	–	4			–	
Cilicia	–	–	–	–	–	–	–	–	–	–	–			1	
Aegyptus	–	–	–	–	1	–	–	–	–	–	1			1	
Arabia	–	–	–	–	1	–	–	–	–	1	2	19		1	
Orientalis	3	–	–	2	1	–	–	–	–	–	6	6	30	3	16

a) Italy provides a mere 26 officers; the West, on the other hand, 60 and the East 30! Recruiting is now concentrated on the periphery of the empire.

b) In the West the Africans continue their advance: 27 of 60 Occidentales; indeed, the Africans equal the Italians!

c) Asia and Syria together provide 10 of the 19 Orientales whose province of origin is known. As a group, the Orientales (30) surpass the Italians (26).

Table 6. Not precisely datable

	I s./II s.	II s./III s.
Italia	24	5
Gallia Narbon.	4	1
Lugdunensis	–	1
Aquitania	–	1
Pannonia Inf.	–	3
Dacia	–	4
Hispania Tarrac.	1	–
Africa	1	1
Mauret. Caes.	–	1
Numidia	1	–
Occidentalis	–	2
Thracia	–	1
Asia	1	5
Pisidia	–	1
Galatia	–	1
Bithynia	–	1
Pamphylia	–	1
Syria	–	2
Orientalis	–	1

To conclude, I append two summarizing tables (7 & 8):

Table 7.

	Italia	Sicilia–Sard.–Cors.	Gallia Narbonen.	Tres Galliae	Germaniae	Britannia	Dalmatia	Raetia–Noricum	Moesiae	Pannoniae	Dacia	Hispania Tarracon.	Baetica	Lusitania	Africa	Mauretaniae	Numidia	Occidentalis	Thracia	Macedonia	Achaia	Asia + Pisidia	Bithynia–Galatia–Lycia–Cilicia	Syria	Aegyptus	Arabia	Orientalis
Augustus/Nero/a.69	277	3	24	9	5	–	1	–	–	–	–	13	10	2	2	1	–	1	1	3	3	29	3	2	–	–	6
Flavii	51	–	11	1	2	–	2	–	–	–	–	17	2	–	–	1	–	7	1	–	3	9	2	–	–	–	3
I s.	41	–	5	1	–	–	3	–	–	–	–	2	–	–	1	–	–	–	–	2	–	3	–	–	–	–	1
SUMMA: I s.	369	3	40/	11	7	–	6	–/	–/	–/	–	32/	12/	2	3/	2/	–	8	2/	5/	6	41	5	2	–	–	10
Traianus/Ant. Pius	107	1	16	3	–	–	2	6	1	1	2	23	6	–	15	8	10	20	–	2	5	21	10	13	12	–	3
Marc. Aur./Sept. Sev.	45	1	3	–	2	1	2	1	–	3	4	3	2	–	11	6	7	18	–	–	1	7	7	7	1	–	7
II s.	55	4	3	–	1	–	2	1	1	–	–	1	3	1	10	2	10	10	–	–	–	8	7	2	–	1	1
SUMMA: II s.	207	6	22/	3	3	1	6	8/	2/	4/	6	27/	11/	1	36/	16/	27	48	–/	2/	6	36	24	22	13	1	11
Caracalla/Gallienus	26	–	1	–	1	1	2	3	1	1	4	5	–	–	14	5	8	14	–	4	1	6	6	4	1	2	6
III s.	15	–	1	1	2	–	1	4	2	4	4	–	–	–	8	8	4	10	1	1	–	6	3	–	1	1	3
SUMMA: III s.	41	–	2/	1	3	1	3	7/	3/	5/	8	5/	–/	–	22/	13/	12	24	1/	5/	1	12	9	4	2	3	9

Table 8

	Militiae equestres cum origine SUMMA	ITALIA	%	PARS OCCIDENTALIS	%	PARS ORIENTALIS	%
Augustus–Nero–a.69	395	277	70%	71	18%	47	12%
Flavii	112	51	46%	43	38%	18	16%
I s.	59	41	69.5%	12	20.5%	6	10%
SUMMA: I s.	566	369	65%	126	22%	71	13%
Traianus–Ant. Pius	287	107	37%	114	40%	66	23%
Marc. Aur.–Sept. Sev.	139	45	32%	64	46%	30	22%
II s.	123	55	44%	49	40%	19	16%
SUMMA: II s.	549	207	38%	227	41%	115	21%
Caracalla–Gallienus	116	26	22%	60	52%	30	26%
III s.	81	15	18%	50	62%	16	20%
SUMMA: III s.	197	41	21%	110	56%	46	23%

ITALIA	%	PARS OCCID. ET ORIENT.	%
277	70%	118	30%
51	46%	61	54%
41	69.5%	18	30.5%
369	65%	197	35%
107	37%	180	63%
45	32%	94	68%
55	44%	68	56%
207	38%	342	62%
26	22%	90	78%
15	18.5%	66	81.5%
41	21%	156	79%

1. When the evidence is totalized per century, the gradual provincialization of the militiae equestres becomes quite clear (Table 8).

	Is.	IIs.	IIIs.		Is.	IIs.	IIIs.
Italia	65%	38%	21%	Italia	65%	38%	21%
Occidens	23%	41%	56%	Provinciae	35%	62%	79%
Oriens	13%	21%	23%				

2. Furthermore, the contribution of the individual provinces of West and East becomes evident (Table 7). At the same time, we can follow the shifts in the 'breeding ground' of the militiae equestres from one province to the other, in the West as well as in the East.

3. The provenance of the emperors is often regarded as a barometer of the degree of provincialization of the officer and civil service cadres. Can this provincialization be explained by a personal intervention by an individual emperor? I am thinking here of Claudius[32] and Hadrian[33] who quite openly favoured the romanized and hellenized provincial elites. I believe, however, that the emphasis should rather be laid on the progressiveness of the evolution. The accession to the throne by a Hispanus or an Africanus is the end of an evolution and does not necessarily imply an acceleration of the provincialization. Under each dynasty one encounters a logical continuation of the evolution, the elements of which are already present under the previous emperors. The important position occupied by the Africani at the time of Septimus Severus and the Severi must not perforce be linked to the accession of Septimus Severus, himself an African. The breakthrough of the Africani was achieved in the preceding period, from Trajan-Hadrian onwards. This advance was the logical outcome of the urbanization policy, of the spread of the municipal system through Roman Africa by Trajan and Hadrian.[34]

The desintegration of the Imperium Romanum is ascribed, among other things, to centrifugal forces, the recruiting of soldiers, officers, senators, emperors taking place in outlying peripheral areas. But on the other hand we must not forget that the Empire was probably able to survive for so long precisely because the provincials were successfully integrated in the army and the civil service.

Appendix

I append a list of the equestrian officers whose origo is explicitly attested. For each officer the following information is given: entry number in the PME; name and origo; details of origo; in parentheses the date, the type of source, the provenance of the source.

A 3. L. Aburnius Severus, *Heracl(ea)*.
– Heraclea ad Salbacum, Caria, Asia; (a. 146 diplome militare; Pannonia Superior).

A 7. M. Acilius Alexander, *Palmyr(a)*.
– Palmyra, Syria; (a.134; diploma militare; Dacia).

A 33 bis. P. Ael(ius) Cl(audia) *Sent(ino)* Gemellus.
– Sentinum, Regio VI, Italia; (a. 212/213–215; ad Tibiscum, Dacia).

A 38. P. Ael(ius) Honoratus, *dom(o) Rom(a).*
– Roma, Italia; (II parte IIs.; Enlake, Dacia).

A 42. P. Ael(ius) Pub(lii) f. Sergia Magnus, *d(omo) Mursa ex Pannon(ia) Inferiore.*
– Mursa, Pannonia Inferior; (a. 191; Old Carlisle, Britannia).

A 76. Aemilius Crispinus, *natus in prov(incia) Africa de Tusdro.*
– Tusdrus, Byzacena, Africa Proconsularis; (a.242; Old Carlisle, Britannia).

A 84. L. Aemilius L.f. [Qui(rina)-Gal(leria)?] Paulus, *ex conven[t(u)] Carthag(iniensi) Attacc(ensi).*
– Attacum, conventus Carthaginiensis, Hispania Tarraconensis; (aet. Traiani; Tarraco, Hispania Tarraconensis).

A 91 bis. (A)emiliu[s...] *Totela[nus].*
Toletum?, Hispania Tarraconensis; (tempus incertum;originis incertae, est in museo Volubilitano, Mauretania Tingitana).

A 103 bis. [. Alleni]dius M. f. [Vel(ina)], *[domo] Castro Truen[t(o)].*
– Castrum Truentum, Regio V, Italia; (ineunte Is.; Asculum Picenum, Regio V, Italia).

A 107 bis. P. Allius Proculus, *domo Roma.*
– Roma, Italia, (exeunte II s./ IIIs.; Osterburken, Germania Superior).

A 126. L. Antistius L. f. Quirina Lupus Verianus, *domu Sicca ex Africa.*
– Sicca Veneria, Numidia; (aet. Hadriani; Maryport, Britannia).

A 127. Tib. Antistius Fausti fil. Quirina Marcianus, *domo Circina.*
– Circina, insula (Djerba) Africae; (aet. Septimii Severi, Lugdunum, Gallia Lugdunensis).

A 133. C. Antonius Aquilus, *Novaugustanus.*
– Nova Augusta, Hispania Tarraconensis; (a. 132; Castramao, Hispania Tarraconensis).

A 158. P. Apulanus P. f. Pol(lia) Sabinus, *domo E[p]or[e]d(ia).*
– Eporedia, Regio XI, Italia; (aet. Claudii; Tilurium, Dalmatia).

A 198. L. Aufidius Panthera, *Sassin(a).*
– Sassina, Regio IV, Italia; (a. 133; diploma militaire; Arrabona, Pannonia Superior).

A 254. M. Aur(elius) M. f. Secundinus, *natus Pannonio [...].*
– Pannonia; (III s.; Roma, Italia).

A 274. [---]ius Annia[n]us, *dom(o) Tipasa.*
– Tipasa, Mauretania Caesariensis; (II parte II s.; Enlaka, Dacia).

B 2. C. Baburius Festus [P]om(ptina) - vel-*[d]om(o)? Arretio.*
– Arretium, Regio VII, Italia; (aet. Vespasiani; Borbetomagus, Germania Superior).

B 12. A. Baebius Regillus, *Suess(a).*
– Suessa, Regio I, Italia; (a. 148 diploma militare; Pannonia Superior).

B 37. [---] Bassus, *Roma.*
– Roma, Italia; (a.122/134; diploma militare, Raetia).

C 10. L. Caecilius L. f. Quirina Caecilianus, *domo Thaenis Afric[ae].*
– Thaenae, Byzacena, Africa Proconsularis; (exeunte II s./ ineunte III s.; Stockstadt, Germania Superior).

C 43. L. Caesius Frontinus, *domo Parma.*
– Parma, Regio VIII, Italia; (I parte III s.; Bowes, Britannia).

C 58. M. Calp[urnius M. f.] Lu[pus], *ex conven[t(u)] Caesar(augustano) Ercavic(ensi).*
– Conventus Caesaraugustanus, Ercavicensis, Hispania Tarraconensis; (inter a. 120–180; Tarraco, Hispania Tarraconensis).

C 106. M. Censorius M. fil. Voltinia [Co]rnelianus, *ex provincia Narbon(ensi) domo Nemauso.*
– Nemausus, Gallia Narbonensis; (aet. Hadriani; Maryport, Britannia).

C 113. Cla[udius (?)] Aelia[nus].
– *quem genuit terra Mauretania[e]*, p(-) obruit terra [Germaniae?]; (III s.(?); Bedburg, Germania Inferior).

C 141. Ti. Claudius Fortis, *Capua*.
– Capua, Regio I, Italia; (a. 133; diploma militare; Gherla, Dacia Porolissensis).

C 210. Aul(us) Cluentius Habitus, *domu Ultin(i)a (sc. Voltinia) colon(ia) Sept(imia) Aur(elia) L(arino)*.
–Larinum, Regio II, Italia; (aet. Septimii Severi; Carrawburgh, Britannia).

C 238. Sex. Cornelius Sex. fil. Quir(ina) Honoratus, *Port(umagnensis)*.
– Portus Magnus, Mauretania Caesariensis; (aet. Septimii Severi; Portus Magnus, Mauretania Caesariensis).

C 244. G. Cornelius Peregrinus (signum) Volantius, *ex provincia Maur(etania) Caesar(iensi) domo Saldis*.
– Saldae, Mauretania Caesariensis; (III s.; Maryport, Britannia).

C 283. [---] Crescens Licinianus, *domo Maurit(ania)*.
– Mauretania; (medio II s.; Carnuntum, Pannonia Superior).

D 9. P. D(idius?) Nepot(is-vel-ianus?), *d(omo?) R(oma?)*.
– Roma ?, Italia ?; (II parte II s.; Enlaka, Dacia).

D 13. P. Divius Italicus, *domi Mauretania Caes[a]r(i)e[n]s(i)*.
– Mauretania Caesariensis; (II s./ III s.; Enlaka, Dacia).

D 16. C. Domitius Antigonus Philippi filius, *Macedo*.
– Macedonia; (aet. Caracallae; Dio, exc. 77, 8, 1–2).

D 22. T. Dom[i]tius Heron, *d(omo) Nicomedia*.
– Nicomedia, Bithynia; (III s.; Old Penrith, Voreda, Britannia).

D 38. (---) Daphnes, *Corinthius*.
– Corinthus, Achaia; (a. 134, contra Alanos; Arrian., ectaxis, 1).

E 6. C. Egnatuleius C. fil. Gal(eria) Seneca, *Tarr(aconensis)*.
– Tarraco, Hispania Tarraconensis; (exeunte I s. / ineunte II s.; Tarraco, Hispania Tarraconensis).

E 12. L. Ennius Marsus, *Setin(a colonia)*.
– Setia, Regio I, Italia; (a. 129; diploma militare; Asia ??).

E 14. Q. Etuvius Sex. f. Vol(tinia) Capreolus, *domo Vienna*.
– Vienna, Gallia Narbonensis; (aet. Claudii; Aquileia, Regio X, Italia).

F 2. Q. Fab[ius] Q. f. [tribu], *Carpet[anus]* -vel-Casper[ianus?].
– Carpet[anus?], Hispania Tarraconensis; (aet. Augusti; Corinthus Achaia).

F 9. Q. Fab[ius. fil.] Gal(eria) M[---], *Saet[abitanus]*.
– Saetabi(s), Hispania Tarraconensis; (aet. Hadriani; Tarraco, Hispania Tarraconensis).

F 38. Q. Flavius Q. f. Pal(atina) Amatianus, *Capua*.
– Capua, Regio I, Italia; (a. 139; diploma militare; Syria Palaestina).

F 40. Fl(avius) Antio[chia]n[us], *d(omo) pr(ovincia) [M]a[ur]e[tan(ia)] [Cae]sarea*.
– Caesarea, Mauretania Caesariensis; (aet. Commodi/Septimii Severi; Grosskrotzenburg, Germania Superior).

F 44. T. Fl(avius) Claudianu[s], *ex Syria Antio(chia)*.
– Antiochia, Syria; (aet. Severorum; Mogontiacum, Germania Superior).

F 45. T. Fl(avius) Claudianus T. fil., *Aemona*.
– Aemona, i.e. Emona ? Pannonia Superior ?; (II s.; Tarracina, Regio I, Italia).

F 53. T. Flavius Laco, *Side*.
– Side, Pamphylia; (a. 138; diploma militare; Moesia Inferior).

F 55. Flavius Long[us], *domo Samosata*.
– Samosata, Syria; (aet. Septimii Severi; Chester, Britannia).

F 61. T. Flavius Modestus, *Roma*.
– Roma, Italia; (a. 149; diploma militare; Brigetio, Pannonia Superior).

G 8. M. Gavius P. filius Palatina Bassus, *Romae*.
– Roma, Italia; (aet. Domitiani; Ephesus, Asia).

G 29 bis. [---]a[---- --G]emellus, *d[omo? P]almyr(a) orien[s?]*.
– Palmyra, Syria; (II parte II s.; Sarmizegetusa, Dacia).

G 30. [---]s Granianus, *Favent(ia)*.
– Faventia, Regio VIII, Italia; (a. 139/145; diploma militare; Pannonia Inferior).

H 7. M. Helvius M. f. Clemens Arnensis (sic), *domo Carthagine*.
– Carthago, Africa; (aet. Severi Alexandri; Volsinii, Regio VII, Italia).

I 15. M. Iulius Ti. f. Pal(atina) Agrippa, *Roma*.
– Roma, Italia; (a. 122; diploma militare; Valentiae Banasae, Mauretania Tingitana).

I 49. C. Iulius C. f., *Thevest(e)*, Corinthianus.
– Theveste, Numidia; (aet. Antonini Pii; Apulum, Dacia).

I 71. C. Iul(ius) Iulianus, *dom(o) Rom(a)*.
– Roma, Italia; (II parte II s.; Enlaka, Dacia).

I 73. Sex. Iul(ius) Iulianus, *ex Germania Superiore<m>*.
– Germania Superior; (aet. Septimii Severi; Caesarea, Mauretania Caesariensis).

I 75. C. Iulius C. f. Vo[l(tinia)] Karus, *ex provincia Narbonensi*.
– Gallia Narbonensis; (aet. Domitiani; Cyrenae, Africa).

I 83. Iulius Maximus, *Roma*.
– Roma, Italia; (a. 135; diploma militare; Britannia).

I 95. M. Iulius M. f. Fabia Pisonianus qui et Dion, *domo Tyro, metropolis Phoenices et Coeles Syriae*.
– Tyrus, Syria; (aet. Hadriani; Eumeneia, Phrygia, Asia).

I 103. C. Iul(ius) Quir(ina) Pudens Q. fil., *domo Caesa(rea) Maur(etania)*.
– Caesarea, Mauretania Caesariensis; (exeunte II s.; Ancyra, Galatia).

I 112 [M.] Iulius Marci fil. Fab[i]a Rufus Pap[in/rianus] Sentiu[s] Gem[el]lus, *do[m]o B[eryto ?]*.
Berytus ?, Syria ?; (exeunte II s./ ineunte III s.; Zellhausen, spectat ad Stockstadt, Germania Superior).

I 127. M. Iulius M. f. tribu Quir(ina) Silvanus, *domo Thubursica*.
– Thubursica, Numidia; (a. 154–156; pridianum; Contrapollonospolis Maior, Aegyptus).

I 128. C. Iulius Laconis fil. Euryclis n. Fab(ia), *Spartiaticus*.
– Sparta, Achaia; (aet. Claudii; Corinthus, Achaia).

I 151. Tib. Iunius Tib. fil. Quir(ina) Quadratus, *domo Roma*.
– Roma, Italia; (exeunte I s./ ineunte II s.; Gallaecia, Hispania Tarraconsensis).

I 153. T. Iunius T. f. Gal(eria) Severus, *Dianensis*.
– Dianium, Hispania Tarraconsensis; (exeunte I s./ ineunte II s.; Dianium, Hispania Tarraconsensis).

L 22. M. Licinius Victor, *Savar(ia)*.
– Savaria, Pannonia Superior; (a. 148; diploma militare; Pannonia Inferior).

M 40. [P. Memmius Cri]tolai filius [Critolaus ?] Theocles, *Delphus et N[icpolitanus]*.
– Delhpi, Achaia/Nicolpolis, Epirus; (aet. Titi; Delphi, Achaia).

M 41. T. Memmius T. f. Palatina Ulpianus, *Roma*.
– Roma, Italia; (II s.; Lambaesis, Numidia).

M 62. L. Minucius M. f. Gal(eria) Pulcher, *domo Tigullis exs Liguria*.
– Tigullia, Regio IX, Italia; (aet. Antonini Pii; Sala Colonia, Mauretania Tingitana).

N 11. L. Nonius Bassus, *Picen(o)*.
– Picenum, Regio V, Italia; (a. 154; diploma militare; Dacia Porolissensis).

N 20. Numisius Maximus, *domo[- 4 l. -]sia*.
– [Knis ?]sia, Africa Proconsularis ?; (aet. Philippi; Tripolitania, Africa).

N 21. L. Numisius L. fil. Pal(atina) Ovinianus, *Tarrac(onsensis)*.
– Tarraco, Hispania Tarraconsensis; (aet. Hadriani; Tarraco, Tarraconsensis).

N 22. L. Numisius Priscus, *Boviano*.
– Bovianum, Regio IV, Italia; (a. 138; diploma militare, Pannonia Superior).

N 26. (---) *Neapolitanus*.
– Neapolis ? Regio I, Italia; (aet. Neronis; Ios. b. I. 2, 16, 1–2).

P 23. L. Petronius Florentinus, *domo Saldas*.
– Saldae, Mauretania; (medio II s.; Obernburg, Germania Superior).

P 28. Q. Petronius Quintianus, *dom(o) [Nico]midia*.
– dom(o) [Nico]midia, Bithynia - potius quam: [Nu]midia; (aet. Gordiani III; Hatra, Mesopotamia).

P 31. Q. Petronius Q. f. Fab(ia) Urbicus, *ex Italia domo Brixia*.
– Brixia, Regio X, Italia; (aet. Severi Alexandri; Chesterholm, Britannia).

P 40. A. Plautius Fab(ia) Bassianus, *Roma*.
– Roma, Italia; (II s.; Cirpi, Pannonia Superior).

P 54. T. Pompeius T. f. Trom(entina) Albinus, *domo Vienna*.
– Vienna, Gallia Narbonensis; (aet. Claudii; Emerita, Lusitania; origo non data in altero titulo: Cularo, Gallia Narbonensis).

P 60. L. Pompeius L. filius Fabia Marcellinus, *Roma*.
– Roma, Italia; (II s.; Ephesus, Asia).

P 65. Tib. Pompeius Pompei Iusti fil. Priscus, *Cadurcus*.
– Cadurcus, Aquitania; (II s./ III s.; Lugdunum, Gallia Lugdunensis).

P 70. L. Pompeius M. f. Claudia Seni[or], *Volub(ilitanus)*.
– Volubilis, Mauretania Tingitana; (aet. Antonini Pii; Volubilis, Mauretania Tingitana).

P 91. T. Popilius T. f. Vol(tinia) Albinus, *Tuders*.
– Tuders, Regio VI, Italia; (II s.; Vicus Martis Tudertis, Regio VI, Italia).

P 93 M. Popilius Palat(ina) Nepos, *domo Roma*.
– Roma, Italia; (aet. Septimii Severi; Caesarea, Mauretania Caesariensis).

P 99. Q. Porcius Q. f. Quir(ina) Vestustinus, *Cantab(e)r Iuliobrig(ensis)*.
– Iuliobriga, Hispania Tarraconsensis; (exeunte I s./ ineunte II s.; Tarraco, Hispania Tarraconsensis).

Q 4. G. Quintius Severus, *dom(o) Camil(ia tribu) Ravenna*.
– Ravenna, Regio VIII, Italia; (ineunte III s.; Jedburgh, Britannia).

Q 5. P. Quintius L. fil. Quir(ina) Terminus, *domo Sicca Veneria*.
– Sicca Veneria, Africa; (II s.; Benningen, Germania Superior).

R 31. [---] Rusticus, *Simit(thu)*.
– Simitthu, Africa Proconsularis; (a. 154; diploma militare; Volubilis, Mauretania Tringitana).

S 16. M. Sellius L. f. Arn(ensi) Honoratus, *domo Choba e[x] provincia Maur[e]tania Caes(ariense)*.
– Choba, Mauretania Caesariensis; (exeunte I s./ ineunte II s.; Zamora, Hispania).

S 19. C. Sempronius M. f. Gal(eria) Fidus, *Calagorrit(anus)*.
– Calagurris, Hispania Tarraconsensis; (inter a. 70–150; Tarraco, Hispania Tarraconsensis).

S 22. M. Sempronius Liberalis, *Acholla*.
– Acholla, Africa Proconsularis; (a. 129–32; diploma militare; Valentiae Banasae, Mauretania Tingitana).

S 47. P. Sextaniu[s ---], *[e civi]tat(e) Traia[nens(ium)]*.
– Civitas Traianensium, Colnia Ulpia Traiana, Xanten, Germania Inferior; (ca. a. 180–92; Carlisle, Britannia).

S 60. M. Stabius M. fil. Fab(ia) Colonus, *d(omo) Luca*.
– Luca, Regio VII, Italia; (ca. a. 147; Adam-Klissi, Moesia Inferior).

S 81. M. Stlaccius C. f. Col(lina), *Coranus*.
– Cora ? Regio I, Italia; (aet. Claudii; Roma, Italia).

S 86. M. Sulpicius M. f. Felix, *domo Roma*, trib(u) Quir(ina).
– Roma, Italia; (aet. Antonini Pii; Sala, Mauretania Tingitana).

T 20. Q. Tineius Q. f. Sab(atina) Her[mes? - on?], *domo Nicomedia*.
– Nicomedia, Bithnyia; (III s.; Roma, Italia).

U 6. M. Ulpius Antiochianus Pulcher, *domo Hemesa*.
– Hemesa, Syria; (ca. a. 160; Thebae, Aegyptus).

U 13 bis. M. Ulp(ius), *Napuca* (sic), Peregrinus.
– Napuca, i.e. Napoca, Dacia; (II s./ III s.; Novae, Moeisia Inferior).
V 27. L. Valerius Priscus, *Viennensis*.
– Vienna, Gallia Narbonensis; (exeunte I s.; Patavium, Regio X, Italia).
V 28. P. Valerius P. f. Gal(eria) Priscus, *Urc[it]anus ex Hisp(ania) Citer(iore)*.
– Urci, Hispania Citerior; (medio II s.; Roma, Italia).
V 30. M. Valer(ius) M. f. Gal(eria) Propinquus Grattius Cerealis, *Edetanus*.
– Liria Edetanorum, Hispania Tarraconensis; (ca. a. 80–90; Tarraco, Hispania Tarraconensis).
V 52 T. Varius T. f. Clemens Cl(audia), *Cel(eia)*.
– Celeia, Noricum; (aet. Hadriani/Antonini Pii; Celeia, Noricum).
V 52 bis [T. ? V]arius T. f. [Cla(udia), *Cel(eia)*?], [Pr]iscus.
– Celeia, Noricum; (aet. Hadr./Ant. Pii; Celeia, Noricum).
V 71. L. Versenus Aper, *Hispell(o)*.
– Hispellum, Regio VI, Italia; (a. 156 vel a. 157; diploma militare; Dacia Superior; origo non data in altero titulo: Petavonium, Hispania Citerior).
V 81. T. Vettius Severus, *d[o]mo Mu[r-?-]*.
– d[o]mo M(a)ur(etania) - vel - d[o]mo Mu[rsa?]; (II parte II s.; Enlaka, Dacia).
V 98. M. Vibius Maternus, *Ilurensis*.
– Iluro, Hispania Tarraconensis; (ca. a. 200–4; Roma, Italia).
Inc. 51. [---], *[ex ci]v(itate) Silia Suriae ?*
– Silia ? Syria ?; (III s.?; originis incertae: Moesia ?).
Inc. 110. *[---(domo)---]lia*.
– [---(domo)---]lia?; (II s.; Beckfoot, Britannia).
Inc. 112 [---], *Luca*.
– Luca, Regio VII, Italia; (II parte II s.; Carlisle, Britannia).
Inc. 140. *[---]rom[--?]*.
– [domo] Rom[a] - vel -[iudex selectus] Rom[ae?]; (aet. Marci Aurelii/ Lucii Veri; Segermes, Byzacena, Africa Proconsularis).
Inc. 188 bis. [---]ius A. f. Fal(erna), *[---/--dom]o Telesia*.
– Telesia (?), Regio I, Italia; (II s.?; Turris Libisonis, colonia Iulia, Sardinia).

Notes

1. E. Birley, The Origins of Legionary Centurions. *Laureae Aquincenses* II (1941): 47–62 = The Roman Army. Papers 1929–1986. Mavors IV, Amsterdam, 1988: 189–205.

2. E. Birley, The Epigraphy of the Roman Army. *Actes du deuxième Congrès International d'Epigraphie grecque et latine*, Paris, 1952: 226–38. = The Roman Army. Papers 1929–1986. Mavors IV, Amsterdam, 1988: 3–11. Id., The Equestrian Officers of the Roman Army. *Durham University Journal*, December 1949: 8–19 = The Roman Army, 147–64. Id., The Origins of Equestrian Officers: Prosopographical Method. *Durham University Journal*, June 1951: 86–95 = Roman Britain and the Roman Army,1961²:154–70 (not included in Mavors IV). E. Birley has also dealt with these problems in other publications: see Mavors IV.

3. H. Devijver, De Aegypto et Exercitu Romano sive Prosopographia Militiarum Equestrium quae ab Augusto ad Gallienum seu statione seu origine ad Aegyptum pertinebant. *Studia Hellenistica* 22, Lovanii, 1975. Id., Prosopographia Militiarum Equestrium quae fuerunt ab Augusto ad Gallienum. *Symbolae Facultatis Litterarum et Philosophiae Lovaniensis*, Series A/3 (Universitaire Pers Leuven): Pars I: Litterae A–I, 1976; Pars II: Litterae L–V, Ignoti–Incerti, 1977; Pars III: Indices, 1980; Pars IV: Supplementum I, 1987.

4. G. Alföldy, Die Truppenkommandeure in den Militärdiplomen, Heer und Integrationspolitik: Die

römische Militärdiplome als historische Quelle (hrsg. v. W. Eck und H. Wolff), *Passauer Historische Forschungen* 2, Köln, 1986: 385–436.

5. E. Birley, The Equestrian Officers..., Mavors IV: 161.

6. H. Devijver, Het militaire tribunaat der angusticlavii in het Vroeg-Romeinse keizerrijk. Diss., Leuven, 1966.

7. E. Birley, The Equestrian Officers of the Roman Army. *Durham University Journal*, December 1949: 8–19 = Roman Britain and the Roman Army, 1961^2: 133-53, 152.

8. G. Alföldy (see note 4), 419.

9. H. Devijver (see note 6). G. Alföldy, *Römische Sozialgeschichte*, Wiesbaden, 1984^3: 108.

10. G. Alföldy (see note 4), 424.

11. G. Alföldy, Römische Heeresgeschichte. Beiträge 1962–1985. Mavors III. Amsterdam, 1987.

12. G. Alföldy (see note 11), 89–127.

13. Review of G. Alföldy, Mavors III (see note 11), in *RBPhH* 77, 1989: 214–16.

14. E. Birley (see note 2), Mavors IV: 161.

15. H. Devijver, Equestrian Officers from the East, The Defence of the Roman and Byzantine East. *Proceedings of a Colloquium held at the University of Sheffield* (eds P. Freeman and D. Kennedy), British Institute of Archaeology at Ankara. Monograph No. 8. BAR International Series 297: 109–225. Oxford, 1986.

16. H. Devijver, Equestrian Officers in the East. *Proceedings of the Eastern Frontier of the Roman Empire Colloquium*, British Institute of Archaeology at Ankara. Monograph No. 11. BAR International Series 553: 77–111. Oxford, 1989.

17–20. These data have been taken from my paper cited in note 16.

21. Els Ijsewijn, Gli 'ordines decurionum' come base di reclutamento delle 'militiae equestres' sotto il Principato. *Bulletin de l'Institut Historique Belge de Rome* 53–4, 1983–84: 41–63.

22. Katrien De Pillecyn, Het nationaliteitenprobleem bij de ridderofficieren tijdens het Principaat. Een nieuwe benadering. Diss., Leuven, 1989.

23. The equestrian officers whose origo is specifically attested are listed in an appendix to the present paper.

24. See note 3.

25. H. Devijver (see note 15), 114.

26. See note 23.

27. 1312: 566 (1st cent.) + 549 (2nd cent.) + 197 (3rd cent.). See Table 8.

28. G. Alföldy (see note 4), 419–20.

28a. See note 28.

29. E. Birley, Septimius Severus and the Roman Army. *Epigraphische Studien* 8, 1969: 63–82, 72 = *Mavors* IV, 21–40, 30. H. Devijver (see note 15), 113.

30. P.A. Brunt, Princeps and Equites. *JRS* 73, 1983: 42–75, 71 No. 11.

31. See note 15, 193–7.

32. Tabula Lugdunensis Claudii: *CIL* XIII: 1668 = *ILS* 212; *AE* 1978: 484; *AE* 1983: 693; F. Vittinghoff, *Hermes* 82, 1952: 348–71; Ph. Fabia, REA 31, 1931: 117–138, 225–260; A. Chastagnol, *Bulletin Soc. Nat. Antiq. de France*, 1971: 282–310.

33. See note 15, 193–7.

34. H. Devijver, La 'Prosopographia Militiarum Equestrium'. Contribution à l'histoire sociale et économique du Principat. In T. Hackens and P. Marchetti (eds), *Histoire économique de l'Antiquité*, Louvain-la-Neuve, 1987: 107–22, 116–17.

Findspots of Military Diplomas of the Roman Auxiliary Army

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Eric Birley has long had a special interest in diplomata militaria which resulted in the publication of a note on a British diploma as early as 1931, when he was a mere stripling of 25 years. This was followed, in 1938, by a masterly review of *CIL* XVI, which had been edited by his long-standing friend Herbert Nesselhauf. Indeed, although the number of diplomas published has more than doubled since that time, many of the observations made in his review still stand as bases for further research, and he has continued to mine the almost inexhaustible field of diploma studies in many articles up to the present day, the most recent being published in 1982/3 (appearing in fact in 1985). It therefore seems appropriate that this paper on the findspots of diplomas should be presented to him by one whose first faltering steps in this area were taken under his guidance and always with his help and encouragement.

Early in my own work on the auxilia of the Roman army it became clear that some knowledge of diplomas is vital, not merely for Order of Battle studies of the auxilia, but also for filling in the consular fasti, providing the names of provincial governors and equestrian prefects, changes in legal procedures etc. and, like Eric Birley, I had begun a collection of new material. Due to the urging of three people I finally published this collection of 78 'new' diplomas. These people were, of course, Eric Birley himself, John Mann, and the late John Morris, with whom I had collaborated in an article on witnesses to diplomas. This collection has continued so that today a third volume of recently discovered diplomas is under active production.

The present enquiry again owes much of its inspiration to Eric. Apart from the invaluable notes of Nesselhauf in *CIL* XVI, there have been 3 recent studies concerning the findspots of diplomas. The first by Mme. Raepsaet-Charlier in 1978, I had unfortunately not seen when I published my own contribution in 1981. The latest study is that of Professor H.-J. Kellner, which was presented at the Passau Coloquium held in 1984, a statistical analysis of the subject. Although the method of presentation varied, and as a result the figures differed slightly, the conclusion reached in all three papers was the fairly obvious one that most (ca. 75%) veteran soldiers remained in the province where they had served on discharge and this tendency was reinforced if they had been recruited within the province, as increasingly happened from the latter part of the 1st century onwards. A few veterans left the province of service to return to their original homes, and it is often possible to demonstrate that their units

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had been stationed near their homes about 25 years earlier. For a very small number there appeared to be no obvious explanation for their choice of venue, always assuming that the findspots really reflect the site of the original veteran's home and not that of a descendant.

It might be thought that the subject has had an ample coverage for new material, although coming to light with increasing frequency, does not look as if it will materially alter these conclusions. Nevertheless, Eric once again showed that there was more to be considered. In the 1982/3 article referred to above (titled 'Veterans of the Roman Army in Britain and elsewhere') he discussed the epigraphic evidence for veteran settlement, particularly with regard to Britain, pointing out that there was a relatively scant record on stone, when considering the size of garrison, in comparison with other provinces. For auxilia he could produce only 4 veteran officers and 8 veteran soldiers. It seemed in his own words, used as the title of an article in *JRS* 75, 1985, by John Mann, that there was a lack of 'epigraphic consciousness' in Britain, as far as stone inscriptions were concerned, as compared, for example, with Pannonia.

In provinces where the evidence on stone for the sites of veteran settlement is scant, can the precise findspots of diplomas be used to pin-point the type of area preferred by retired soldiers? Eric suggested that they could and supplemented the small number of auxiliary tombstones with the diploma evidence. Using of course the cautious phrasing necessary, he concluded '12 of the 14 men to whom diplomas for the army of Britain have related remained in the province and nearly 1/2 of them seem to have settled, or to have been settled, on the land'.

Reading this article I was struck by the thought that, unwelcome though the labour might be, I should, one day, have to look at findspots for the entire collection of diplomas in more detail to see how much more might be gleaned from a closer study of the circumstances of each find.

This resolution received a further spur through the striking observation made by Slobodan Dušanić, in a note (88) in an article appearing in 1982, concerning the reason for the issue of diplomas. The observation was that there were more diplomas issued to cavalrymen than might be expected, bearing in mind the relative numbers of alae and cohorts in the auxilia. The statement proved to be startingly accurate. The latest figures for recipients, where their status is absolutely certain, is that in 110 diplomas there are 59 cavalrymen to 51 infantrymen—i.e. about 53.6% of known diplomas were issued to cavalrymen. (In these figures I include cavalrymen in cohortes equitatae as well as those in alae. If cavalrymen in alae only are considered the figures become 44:64 or 40%). According to my calculations, including cavalrymen of both categories, and making some allowance for the fact that there may have been more cohortes equitatae than our present evidence suggests, cavalrymen amounted to roughly one third of the strength of the auxilia. In other words, if chance had anything to do with it, we should expect there to have been at least twice as many infantry recipients as cavalry. How can the discrepancy be accounted for?

Statisticians might argue that the sample is not large enough, or that there has been some bias in excavation of certain sites. But in fact many of the diplomas have been found accidentally and no obvious selection has been at work.

In 1981, as a result of an examination of the distribution of praetorian diplomas in time and space, I suggested that not all praetoriam veterans would wish to have diplomas giving them the right to take peregrine wives. Most of them, particularly in the pre-Severan period, when praetoriani were largely recruited from Italy and the romanised provinces, would marry women who had Roman citizenship so that there would be no need for the grant of conubium. Only those who intended to marry Iunian Latins, perhaps their freedwoman concubines, or women whose legal status was dubious, would require them. There might be an additional category of those, who having entered service in the Danubian legions from faraway Thrace or Pannonia, wished to have proof of their service in the Emperor's personal guard for the improved recognition of status that it would bring them in their home cities. (cf. the Scaptopara inscription IGRR 674, a rescript which records a praetorian veteran Aurelius Purrus or Pyrrhus acting as delegate for his fellow citizens in a petition addressed to Gordian III in Rome, in 238.) I suggested then that praetorian diplomas, that is the bronze copies of the constitutio set up in Rome (Gaius I, 57), were only issued to those who had requested them and perhaps paid for them.

From this consideration it was a short step to wondering if the discrepancy in the expected proportions of cavalry and infantry recipients of auxiliary diplomas could be explained in a similar manner. It is known that cavalrymen received higher pay than infantrymen, Some part of this higher pay may have had to do with the additional expense incurred in service but it is clear when looking at tombstones of the auxilia that cavalry tombstones in general are more elaborate, and ergo more expensive, than those of most infantrymen. Did the surplus cash of the cavalryman also allow him to apply and pay for the bronze documents we know as diplomas more readily than his poorer colleague in the infantry? This suggestion has been accepted by some scholars as a reasonable explanation of the figures though not by others, and it remains to be verified or disproved.

The question that follows for the auxilia, if this hypothesis has any validity, is what would make a man wish to have a bronze copy and pay for it? Was there a real need in certain cases or was possession what would be called today an 'ego-trip'? All would benefit from the constitutio if they had satisfied the conditions of service. Was there a less durable alternative to bronze for poorer veterans of the auxilia? If there was, no such document has yet been found.

In a recently published dissertation Dr. Stefan Link (1989) considered the question and suggested several reasons why diplomas may have been requested or bought. As he pointed out it may simply have been a matter of having enough money to buy one and wishing to have a record of service. But he thought that there must have been practical reasons as well. Before AD 140, for instance, there is the fact that citizenship is granted not merely to the veteran but to existing children and descendants so that a durable copy of the constitutio would be of lasting value to the family of the veteran as well as to himself. Thus those who had children before discharge would be particularly anxious to have bronze copies. It must be pointed out here that the evidence does not entirely support this contention since many diplomas (particularly in the pre-Hadrianic period) fail to name existing children. Link also points to a further bonus for the veteran in that possession of 'new citizenship' gave partial exemption from

liturgies i.e. immunity for a certain length of time from certain expenses and obligations in the community in which he settled (BGU I, 180, of AD 172.

It is now time to leave theoretical considerations and look at the preliminary results of a closer reappraisal of findspots. It must be emphasised here that there are problems concerning the identification of findspots. Many diplomas were found in the days before scientific excavation and recording gave a firm archaeological horizon for their deposition; others are victims of the booming (and illegal) trade in antiquities, so that greed and deceit obscure even the country from which they have been exported; some have been found in areas where our present knowledge allows us to speculate, but not prove, that they lay within the territoria of ancient cities. The six tables appended summarise the results of an investigation which will need to be modified as new studies of the geography of Roman provinces appear.

Praetorian and fleet diplomas have been excluded as these will more properly form the basis of separate studies, but a total of 242 diplomas of the auxilia have been scrutinised. Included in that total are those known as 'Special' diplomas because they were granted without regard to the usual qualifying term of 25 or more years service, and also counted are those granted to the equites singulares Augusti, who began their service in the auxilia, and whose diplomas carry the standard auxiliary formula of the post-140 type.

The findspots have been broken down into the following categories:

Table I:	Finds made in ancient towns or their territoria	65
Table II:	Finds from graves or hoards	8
Table III:	Finds from military sites	56
Table IV:	Finds made in fort vici or other military settlements	40
Table V:	Finds from 'Roman sites'	15
Table VI:	Finds for which the information is so far unclear	58

Towns are defined as sizeable settlements that the Romans would recognise as towns—coloniae, municipia, large military settlements that frequently became municipia or coloniae, although perhaps not in that category at the time the diplomas found there were issued, and some few that are popularly known as civitas capitals, although this term does not find favour with all scholars. In some instances it has been suggested that the diplomas lay within the territoria of cities, even though they came from sites some km from the identifiable centres of population.

The categories created for these tables are not necessarily mutually exclusive, for example three of those found in graves or hoards were found in town cemeteries. Some examples listed under military settlements could as easily have been placed under towns, e.g. those from Brigetio, but, as will become clear, this blurring of categories does not materially affect the final assessment.

Clearly the maximum attention must be given to those diplomas which are found intact, that is two tablets found together, sometimes with the triple strand of binding wire still in place; there are 51 of these in the present sample i.e. 21%. They may be judged to be especially important if the circumstances of the find suggest that they were deliberately buried, as part of a hoard, in a grave, or actually inside a dwelling. Where there are two plates

corroded by time, which have been recorded (even if one has since been lost, as with the Stannington diploma—Tab. VI, No. 33) the diplomas carry the same weight as perfect examples, as far as findspot is concerned. Single, whole plates (total 18) are also significant, as they too carry useful information about the date, the recipient, and his unit, if nothing else. Their preservation is at least interesting. For, of course, one of the difficulties in this investigation is that diplomas are eminently portable objects. If large stones have 'walked' along Hadrian's Wall, how much further afield might not these bronzes go? They may have been carried over long distances to be discarded by descendants of their first owners. Each find must be judged as closely as possible on the detail given about the circumstances of its discovery.

What attention should be paid to fragments? Some are clearly re-used. Three examples (one perhaps from Cirencester, one from Volubilis and one from Banasa; Table I, nos. 40, 42 & 51) were cut into circular shapes. Does this mean that the findspot must be discounted? May one dare to believe that it means that grandfather's old diploma, which has been lying around, has lost any legal or sentimental value and so is carved into useful pieces, for instance as lids for pots or jugs?

Other diplomas have clearly been broken up in antiquity into rectangular fragments only one or two of which are preserved. These have been identified through photographs, although clearly personal inspection would be preferable. In the tables they are preceded by an asterisk. Although it is tempting to do so, it should not always be assumed that these last pieces were destined for the metal worker's crucible, which somehow they escaped, perhaps through carelessness. We may not be able to recognise their function but the existence of the circular fragments suggests that the possibility of re-use must always be considered. There are, however, examples where a lucky escape from the smelter may be demonstrated with almost certainty. These are signalled by an X before the number in each table. There are 12 of these, but other tiny scraps could fall into this category if more was known about them.

The Tables are intended to speak for themselves, but several observations may be made before turning to the summary analysis in Table VII. Of the 65 town finds 10 are complete, or almost complete, diplomas (although one example is rather bizarre since it was found wedged into a pier of the Roman bridge at Mainz when it was being demolished in 1884. Was this placed there for safety? Had it been stolen?). There are 4 whole single plates.

How do these diplomas break down? 6 of the recipients were alien or foreign to the area of the find; that is born far away from the province in which they settled, even if they had served for many years in that same region. There is, for example, a Cilician who served in Moesia and retired to Montana in that province, far behind the frontier line (Table I, No. 2); another Cilician served in Moesia superior, received his diploma as a serving soldier in 100 and retired to the colonia at Siscia in Pannonia (Table I, No. 10). It is possible that he actually fought in the first Dacian war with his unit (cohors I Antiochensium, which is believed to have participated in the wars) and received his discharge ca. 102. He may even have been transferred to another unit during the course of the wars and thus have been released in Pannonia, which would explain his choice of settlement (but this is speculation). A Syrian serving in Mauretania Tingitana retired to Banasa and, if the find-spot in a splendid house

tells us anything, did very well for himself in his new surroundings (Table I, No. 4). Just over two decades later another Syrian, with a Syrian wife, joined him at Banasa (Table I, No. 16). [Yet one more Syrian, this time with a Spanish wife, is recorded on a fragmentary diploma from Banasa, of AD 122 (Table I, No. 28)].

The Mainz tablets were issued to a Thracian who was surely alien to Germania superior (Table I, No. 5) and the recipient of the diploma of Dacia superior, who settled near his former fort at Drobeta, came from Stobi in Macedonia (Table I, No. 61).

Among the single plates preserved, one found at Aquincum, in Pannonia, relates to a man from Spain (Table I, No. 11). These examples suggest that men, who were not in their native milieu and also far from their former encampments, might well feel a need to ensure that they could produce authentic references to their Roman citizenship.

Another complete diploma was issued to a man who travelled from Germania, where he had served, to his home terrain in Pannonia (Table I, No. 1). This surely illustrates a need for documentation of some kind, for on such a journey the traveller would necessarily encounter officials who might query his status. For the remaining three there are no such clear explanations of need save that, when moving from fort to city even within the same province, it might be thought safer to have proof of the privileges to which they were entitled.

This last explanation must also serve for at least one of the remaining three single whole plates which were also found in town sites. One veteran, however, undertook the long haul from Macedonia to Tricornium in Moesia superior, where his cohort had earlier been stationed and where he had met his wife (Table I, No. 25). There is no simple explanation for the finding of a diploma of an auxiliary veteran from Moesia superior in Padua—if that is really where it was discovered—(Table I, No. 57).

Among the fragments found in towns or in their territories are other examples of men who may have felt themselves alien to the provinces where they settled (like the probable Easterner in No. 53) or who undertook long journeys back to their homelands (as did the Thracian in No. 17). Such explanations may be deduced even when full details are lacking. As may be seen in Table VII, they total 25 and the number may be swelled to 44 if those who settled in towns that were some distance from their former sites are added.

Thus for town sites, where there is sufficient evidence, need is reasonably well-attested. That is to say, when all the factors are known and can be taken into account, we may see why 68% of those veterans attributed in the tables to towns might request or purchase bronze diplomas.

Looking at the entire range of town finds, most of which, of course, are fragments—some large but some extremely small—can anything be said about the favoured towns of settlement?

On head count alone Volubilis and Banasa come equal first in popularity with 13 examples each. Most of these, however, are mere scraps and Thouvenot (1951) suggested that some of the Banasa fragments were part of a scrap merchant's stock, since a number of them were found in or near the forum. How much credence may be placed upon such fragments as accurately reflecting veteran settlement? In the case of Volubilis and Banasa it seems probable that they are more likely than not to have attracted veterans on discharge although there

is very little epigraphic support for this suggestion. Banasa has not a single veteran tombstone recorded by Euzennat and Marion (1982), and Volubilis can only show one (although there are records of four serving auxiliary soldiers). But these two sites were among the largest and most attractive in Tingitana, and one might suppose that the area over which a scrap merchant collected his wares would be likely to be within the territorium of a city rather than further afield.

Similarly, a recent find of three scraps of diplomas at Acker bei Stein, all three being of different dates, may perhaps indicate settlement within the territorium of Lauriacum in Noricum.

The other favoured sites on diploma evidence nearly all have military as well as civilian overtones. Here diplomas fit in well with other epigraphic evidence. There are 6 from Brigetio (Pannonia superior), 3 from Alba Iulia, where the legionary canabae at Partos early attracted military settlers (Dacia superior), 2 or 3 from Viminacium (Moesia superior), 2 from Mainz, including the mysterious bridge find (Germania superior). There are 21 single finds from towns of similar origin in different provinces. Clearly many veterans preferred to settle where they would mix with others of like background. It should be noted, however, that some veterans, who have been ascribed to towns, settled in what has been estimated to be within the possible territorium of a city, i.e. on land attributed to the town. These men presumably lived as farmers although they may also have participated in civic life.

This leads naturally on to a consideration of diplomas found in fort vici and actually inside forts themselves. The 56 diplomas or fragments found inside forts (Table III) together with the 40 from fort vici (Table IV) provide the greatest stumbling block to the theory that need was the spur for the acquisition of a bronze diploma. Even here, however, the Tables show that 35 of the total of 96 in these two categories (36%) were either alien to the area or province or seem to have undertaken a long journey to arrive at the site of deposition. For the rest, what need had men who lived close to their former stations to provide proof that they had earned certain privileges? They could produce ex comrades who would vouch for them as well as request the local fort commander to give them a document, perhaps like that of Valerius Noster, of ala Vocontorium in Egypt, whose commander provided him with a discharge certificate in the form of a letter written on a wooden tablet (ILS 9060).

They may have wished to have proof of status for the benefit of existing children and their descendants, in the period before AD 140, when the formula changed, as Stefan Link suggested. However, in this period only 6 recipients name children in both fort and fort vici examples, while 11, where we can be sure, do not name children and the remaining 20 (excluding Special diploma recipients where neither wives nor children are mentioned in the formula) are fragmentary and produce no evidence on this score.

The large number of diplomas found inside forts is puzzling. Why would a veteran leave his diploma in a fort? [In this category only 8 are complete, i.e. two leaved, there is one single whole plate, and the rest are fragmentary]. One answer that has been given in the past is that they were left in a fort for safe keeping. This explanation is unsatisfactory. If a diploma served any useful function the recipient would surely keep it in his possession. One possibility is that in some instances something intervened between the issue of the constitutio in

Rome and the arrival of the bronze copy at the fort, which prevented the veteran from collecting it. But in this case we should have to suppose that over half of those found in forts were uncollected. An alternative solution to the problem is that some inducement was offered to the heirs of a dead man to return his diploma if he was childless or his children had predeceased him (this would apply particularly in the pre 140 period) and the named wife had outlived her spouse, when there would be possiblities for fraudulent use. It seems clear that the Roman authorities were concerned about misuse of the privileges granted to veterans, witness the clauses introduced into Fleet diplomas sometime before 158 and to the special diplomas issued to decurions and centurions after 140, which were designed to prevent men claiming the grant of conubium with women who were not the mothers of the children named. A papyrus from Egypt (P. Columbia 325) shows that the heiress of a deceased serving soldier could negotiate with the authorities over his deposita and equipment, a similar mechanism may have existed to pay certain sums in return for diplomas that were no longer relevant.

Nevertheless, however they came to be in forts, some were eventually destined for the metal worker's crucible. One whole diploma was found with other bronze objects in a group just inside the southern rampart of the fort at Taliata (Table III, No. 1), two were found in sites identified as metal workers' workshops (Table III, Nos. 8 & 9); 3 fragments of differing dates were found together in the fort of Românasi, suggesting a collection of scrap (Table III, Nos. 13, 14, & 44). Eight fragments were found in barrack blocks at Buciumi, in Dacia Porolissensis: 5 in Barrack block 5, 2 in Barrack block 2, and one in Barrack block 6 (Table III, Nos. 20, 21, 35, 41, 42, 43, 51) four of these were rectangular and had clearly been deliberately broken in antiquity since two of them (from different Barrack blocks) proved to fit neatly together. Perhaps they were eventually destined as scrap for the metal worker, but it may be that they were deliberately fractured in the interim to prevent fraudulent recirculation.

Whatever the reason for the presence of diplomas or fragments in forts, it is certain that very careful checks should be made before a unit is sited at a fort solely on this evidence. This may be illustrated through examples where the outcome is clear. One man who served in Lycia Pamphylia returned to Moesia inferior where his unit had been stationed more than two decades previously, and his complete diploma was found inside a fort at Kadiköi (Table III, No. 48). Possibly this was the unit's former station, but if the provinicial name had been missing from his diploma and other evidence was lacking there would be a great temptation to place the unit there in AD 178. Two fragments of the same diploma (later joined by a third) were found in different military sites in Dacia superior (Table III, No. 31 at Mehadia; No. 32 in a fortlet not far from Mehadia). In fact the diploma listed units in Dacia Porolissensis, so that neither findspot qualified as the fort of the cohort concerned. Two diplomas of the same date, both issued to Palmyrene archers, were found in different forts, and one of the scraps found at Românasi proved to be of the same issue. Does this mean that we should envisage a body of archers split between the forts of Căsei, Porolissum and Românasi? Were three separate units involved? The only epigraphic indications so far point to Porolissum as the early station of this numerus.

The same proviso applies to diplomas found in fort vici, where among the 40 there is a similar mixture, with 10 complete examples 1 whole tablet and the rest fragmentary. The two

diplomas of AD 157 issued to Eraviscans, which were found in a building in the vicus of the fort at Lussonium (Pannonia inferior) do not indicate that the unit of the recipients (cohors I Thracum Germanica) was stationed at that fort in 157; Hungarian scholars believe that the unit lay at Anamatia further north and that the veterans settled outside Lussonium because it was in Eraviscan territory. (Table IV, Nos. 24 & 25). One diploma from Regensburg dated to AD 113, is reckoned by Professor Karl-Heinz Dietz to be an heirloom, since it was buried in a level which he associated archaeologically with the Marcomannic Wars. This offers as explanation for the finding in Raetia of a diploma of Pannonia superior, issued to a Batavian unit and naming a Batavian wife and family. It may have been transported there by descendants of the veteran and illustrates perfectly the pitfalls inherent in analysing the material (Table IV, No. 7). Similarly, another diploma from a vicus at Regensburg was issued to a veteran of ala II Flavia milliaria in AD 153, but by that time most Raetian archaeologists believe the ala was already in Aalen (Table IV, No. 22).

There are still difficulties of various kinds over the identification of sites where the remaining 73 diplomas or fragments listed in Tables V and VI were found.

Many are stray finds in the modern rural scene, dug up in the course of activities like ploughing, building barns, or the like. They possibly indicate settlement on the land but without archaeological investigation of the findspots, we cannot tell if the owner (if he indeed deposited the find on that spot) was a farmer, or earned his living in some other way. In spite of this, internal evidence shows that no fewer than 47 of the 73 are candidates who reveal possible real need of diplomas (see the first three columns of Table VII).

In sum, 55% of the 242 diplomas examined prove their owners either to have been alien to the province in which they served or may be assumed to have settled, or that they have undertaken journeys over considerable distances from the place of discharge to the presumed site of their future homes.

It is unlikely that there will be complete agreement among diploma scholars on the significance of these findings. Proof of need, where it can be demonstrated, is not proof that only those who needed them got bronze copies of the Rome tablet which certified their privileges. However, if these indications are coupled with the overweighting of the cavalry recipients and the consequent possibility that some payment for the tablets known as diplomas was involved, there are some grounds for arguing that distribution to those who qualified for the grants was not universal.

Perhaps the unfortunate Gaius Maevius Apellas, veteran of ala Apriana, who was flogged at the order of the strategus, in Philadelphia, in Egypt, had not bothered to obtain a bronze diploma certifying him as a Roman citizen and so could not prove his status before summary justice was executed upon him (Aegyptus xii, 129–30, of AD 153).

Life itself is untidy, and epigraphic analysis will never solve all the problems it sets out to examine. All scholarship can ever do is to provide pointers to possible solutions.

TABLE I

Auxiliary diplomas found in town/city territorium sites

* Fragments which may have been deliberately broken.
X Fragments which may have been destined for the melting pot.
S 'Special' diploma.

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
1.	RMD 79	17.6.65	pediti, Liccaio, Liccai f. Breuco coh. VII Breucorum Germania Serving soldier	Found Negoslavci, Yugoslavia 8 km west of Sotin (Cornacum). The latter was a civitas centre. More importantly the findspot is 14 km east of Vinkovci (Cibalae) which was a municipium and in the general tribal areas of the Breuci. Possibly Liccaius was attached to the municipium.	Tab. I & II
2.	16.22	7.2.78	pediti Perasi Publi f. Aeg(isso) cohort. Cilicium Moesia Serving soldier	Found in the marshes below the town of Ferdinand, where the fort and the civitas Montanensium lay, in NW Bulgaria. Devijver (1982) argues that Perasis came from the city of Aegae in Cilicia, rather than Aegyssus in Moesia, in which case he was foreign to the province.	Tab. I & II
X3.	Binsfield, 1988	[13.6.80]	No details [Pannonia]	Found in the south part of Trier, with coins (mostly late folles and some of Valentinian), glass and pieces of bronze. The bronze shows signs of melting. A possible collection for the bronze smith?	Corner frag. Tab. I

4.	16.159	9.1.88	equiti, Domitio Domiti f., Philad(elphia) (Syria) cohort. II milliariae sagittar(iorum) Mauretania Tingitana Serving soldier	[1]Found in the southern quarter of Banasa (an Augustan colonia), in a beautiful house on the Roman level. The plates were covered with white powder. It is suggested that the powder represented the remains of a support on which the plates had rested and that the owner, or his descendants had lived there. Syrian recipient—foreign to the province.	Tab. I & II
5.	16.36	27.10.90	equiti, Mucapori Eptacentis f., Thrac(i) cohort. I Aquitanorum veteranae Germania superior Serving soldier	[1]Found in 1884 in a pier of the Roman bridge at Mainz when it was being destroyed. The civil settlement at Mainz became the seat of government of Germania superior under Domitian. Cohors I Aq. vet. was either at Friedburg or Arnsburg (NE of Mainz) in this period. The Thracian was foreign to the province.	Tab. I & II
6.	16.38	13.7.94	pediti Veneto Diti f., Davers(o) et Madenae Plarentis filiae, uxori eius, Deramist(ae) et Gaio f. eius cohort. III Alpinorum Delmatia Serving soldier	Found in Salona in 1488. The Daversi were a people of S. Dalmatia. Towards the end of 1st century coh. III Alpinorum was stationed at Andetrium north of the colonia of Salona. The latter was also the centre of government of Dalmatia.	Tab. I & II
7.	RMD 6	12.7.96	pediti, Dolenti Sublusi f., Besso et Valenti f. eius cohort. VI Thracum Moesia superior Serving soldier	[1]Found at Viminacium. The precise findspot is unsure. It was said to have been found in the manufacturing quarter of the town near a Roman and early Byzantine fort, but the editors were told that it really came from a grave in one of the Roman cemeteries of the city. Viminacium is not in the tribal area of the Bessi, but a legionary canabae had probably developed there in the late 1st century. This would be attractive to veterans.	Tab I & II

TABLE I (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
*8.	RMD 7	14.8.99	pediti, Bonioni Verani f. [- - - -] [co]h. II Hispanor(um) [Moesia superior] Serving soldier	[1]Found Alba Iulia (Apulum) in Dacia in 1962, while digging foundations for a new school in the via C. Dobrogeanu-Gherea. The recipient was still serving and probably took part, with his unit, in the Trajanic Dacian Wars (cf. Strobel 1984). The legionary canabae or the Hadrianic municipium may have attracted him or his descendants. Not in the province of service.	ca. 1/2 Tab. I
9.	16.44	14.8.99	pediti, M. Antonio M. f. Rufo, Abretten(o) (Moesia) et Marco f. eius cohort. II Gallorum Moesia inferior Serving soldier	Found at Oltina (Altinum), district of Constanza, site of a 4th century fort. It was found between two rough ovens, together with pottery handles and dishes. Aricescu (1974) suggests that coh. II Gallorum garrisoned Sacidava ca. 99–112. Sacidava is 7–8 km from Altinum.	Tab. I
10.	16.46	8.5.100	pediti, Sapiae Sarmosi f., Anarzabo cohort I. Antiochensium Moesia superior Serving soldier	Found in 1909 in the colonia of Siscia (Pannonia). The recipient, from Anarzabus in Cicilia, probably took part with his unit in the first Dacian War (cf. Strobel 1984). An Easterner—foreign to the province.	Tab. I & II
11.	16.47	19.11.102	pediti, L. Singeio L. f., Rufiano Lucens(i) coh. I Montanorum Pannonia Serving soldier	[1]Found at Aquinicum in the Danube. The recipient came from Lucus Augusti in Spain. Foreign to the province.	Tab. I

*12.	Mirković & Vasić (1986)a	102?	No details [Pannonia]	Found either in the territorium of Margum or in the area of Viminacium.	Frag. Tab. I
*13.	16.52	106 (June/ July)	ex [- - - -] Clementi A[- - -f., - - - -] et Secciae Sabibi f[iliae uxori eius] et Saturnino f. ei[us] cohort. I Astu[rum] [Noricum]	Found Wels (Ovilava), which became a municipium under Hadrian. The station of coh. I Asturum in the period of issue of the diploma is unclear (cf. Genser 1986) but is, in any case far from Wels. The tablet seems to have been deliberately fractured in antiquity.	Rect. frag. Tab. I
13a.	See Table II, No. 3				
14.	RMD 11	100/107	Status not extant. [- - -]i f., Ti[- -] [et - - - - - - - - - - - - - fil] iae Iaphn(a)e ux[ori eius] [Mauretania Tingitana?]	Found Lixus, a Claudian colonia	Tiny frag Tab. II
15.	RMD 83	96/108	No details [Britannia]	Found in London, 1978, in a house in Watling Court, Cannon St., south of Cheapside. The house was erected ca. AD 80 and gutted by fire ca. 120–125. The diploma was probably intact at the time of the fire. The recipient perhaps served in the governor's body-guard (Hassall 1973) or retired from elsewhere in Britain to London.	Frags. Tab I and Tab. II cemented together by fire
16.	16.161	14.10.109	ex gregale, Bargati Zaei f., Hamio et Iuliae Iuli f. Deisatae, ux(ori) eius, Surae, et Zenae f. eius et Saturnino f. eius alae I Hamiorum sagittario(rum) Mauretania Tingitana	[2]Found in the Banasa in the quarter to the north of the forum, in a large room near a bakery. Both the recipient and his wife came from the East.	Most Tab. I Frag. Tab II

TABLE I (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
*17.	RMD 84	[14.10].109	ex gregal[e], Sitali Cultra [- f. -] et Iuniae Gaditani fil. M[- - -] [uxori eius], et Martiali f. e[ius] alae I Augustae c. [R.] Mauretania [Tingitana]	Found in 1969 during archaeological excavations on the hill of Krakra, near Pernik. This has produced occupation levels of the Roman period and possibly lies within the territorium of Serdica. A long journey home.	Frag. Tab I
*18.	16.162	14.10.109	[ex - - - -]te, [- - -]cti f., Thrac(i) (coh) [Maur]etania Tingitana	[3]Found at Banasa in an area south of the supposed Capitolium. A Thracian —foreign to the province, cf. RMD 84 = No. 17 above.	Rect. frag. Tab. I
19.	RMD 12	99/110	No details [Mauretania Tingitana]	[4]Found Banasa, but no details of the findspot were given (Thouvenot, 1951)	Tiny frag. Tab. II
20.	16.58	110/113?	No details [Moesia inf]erior	Found inside Adamklissi (Tropaeum Traiani) which became a municipium under Marcus.	Rect. frag. Tab. I
20a.	See Table II, No. 4				
21.	16.59	107/114	No details [Germania inferior]	Found in the site of ancient Burgunatium near Calcar.	Rect. frag. Tab. I
22.	16.63	[8.9.117]	No details [Germania superior]	[2]Probably found in Mainz	Tiny frag. Tab. I
23.	RMD 15	98/117	No details [Mauretania Tingitana]	[1]Found at Volubilis under the east portico of the temenos of the Capitolium.	3 tiny frag. Tab. I
*24.	16.165	114/117	No details Mau[retania] Tingitana	[5]Found at Banasa in the same area south of the Capitolium as 16.162 = No. 18 above.	Rect. frag. Tab. I

25.	16.67	29.6.120	ex pedite, M. Antonio Timi f. Timi, Hierapol(i) et Dorotumae Dotochae fil. uxori eius, Tricorn(io) et Secundo f. eius et Marcellinae fil. eius. coh. I Flav(iae) Bessor(um) Macedonia	Found Tricornium, in Moesia superior. The recipient, a Syrian, presumably met his wife during his earlier service with the cohort in Moesia. He was both foreign to the province and undertaking a journey to the place of presumed settlement.	Most of Tab. I
26.	16.167	100/120	No details [Mauretania Tingitana?]	[2]Found Volubilis	Tiny frag. Tab. II
*27.	RMD 18	114/120	ex gregale, [- - - -] Fusci f., [- - - -] [et - - -]ae Rufi fil. Rufinae [uxori eius] et Fuscinae fil(iae) [eius] [alae - - - - - -] c. R. [Mauretania Tingitana]	[3]Found Volubilis	Rect. frag. Tab. II
*28.	16.169/73	18.11.122	ex gregale, M. Antonio Antoni f. Maximo, Syro et Valeriae Messi fil. uxori eius, Transduc(ta) (Baetica) et Maximo f. eius, et Maximae fil. eius. alae Gallor(um) Taurian(ae) c. R. torquat(ae) victr(icis) Mauretania Tingitana	[6]Found in the forum at Banasa in the angle at the foot of the stairs which led to the portico in a level which was otherwise completely sterile. First piece published in 1934, the other in 1942. Both the recipient and his wife were foreign to the province.	2 rect. frag. Tab. I
X29.	16.170	[18.11].122	No details [Mauretania Tingitana]	[4]Found at Volubilis, to the right of the 'decumanus maximus' in the last important house in that section, with 16.176 = No. 39.	Tiny frag. Tab. I
30.	16.171	124 (last nund.)	ex de[curione, - - - -]ni Daci [f. - -] [et - - - -]e Luci fil. Sat [- - -] uxori eius et Dacio [f. eius] [alae Geme]llian(ae) [c. R.] [Mauretania Tingitana]	[7]Found Banasa; cf. other Banasa fragments. The names of the recipient and his family appear to be Celtic. He may be foreign to the province.	Frag. Tab. I

TABLE I (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
31.	RMD 26	123/125 [May 16 – Iun. 13}	[ex - - - - - - - - - - f, Ha]drumet(o) [et - - - - - - - fil. uxori eius] Pann(oniae) [et - - - - f.] eius [et - - - - f.]eius Unknown unit. [Dacia superior?]	[2]Found Alba Iulia in the suburb of Partos, to the east of the road leading to Mureş i.e. among the ruins of the legionary canabae. The recipient probably served in Pannonia before the Dacian Wars, and there met his wife. He came from Africa and was foreign to the province.	Rect. frag. Tab. I
*32.	RMD 24	90/129?	[- - - - - - - - - -] Cappad(oci) [et - - - - - -f. or fil.] eius [Mauretania Tingitana?]	[5]Found at Volubilis in 1957, in two pieces in the southern quarter 'sur le chemin des visiteurs'. The recipient, from Cappadocia was foreign to the province.	Two frag. Tab. I
33.	Lenoir-a 1983-4	131	[ex de]curione, [- - - -] Nigrino castris. [- - - - - - - - -]or(um) c. R. Maureta[nia Tingitana]	[8]Found Volubilis?	Frag. Tab I
34.	16.173	18.8.129/132	ex gregale M. Publilio Publili f. Saturnino, Tingit(ano), et Saturnino f. eius et Prisciano f. eius. alae Taurian(ae) c. R. [Mauretania Tingitana]	[8]Found Banasa during excavations in 1946. No details available. The veteran undoubtedly served in Tingitana.	ca. 1/2 Tab. I
35.	16.82.	14.4.135	ex pedite [Man]sueto Luci f. Trever(o) coh. II Dalmatarum [Britannia]	Found in the forum at Wroxeter in a small room destroyed by fire. Among the debris were many pieces of iron and bronze, keys levers and plates of locks in both metals, iron and bronze strapping etc. Metal working shop? A Treveran—foreign to the province.	ca. 1/2 Tab. I
36.	RMD 37	117/138	No details	[9]Found Banasa cf. other Banasa fragments.	Frag. Tab. I

X37.	RMD 93	135 (Dec.10)/ 138 (Iul.10)	No details N[oricum]	[1]Found Acker bei Stein, not far from Roman Lauriacum. Scrap metal? Cf. Nos. 54 & 63.	Rect. frag. Tab. I
38.	RMD 43	138/140	[ex - - - - - - - -] Lucei [f., - - -] [- - - - fi]l. eius [Mauret]ania [Tingitana]	[7]Found Volubilis.	Frag. Tab. I
X39.	16.176	18.7.123/129 or 132/140	No details [Mauretania Tingitana]	[8]Found at Volubilis with 16.170 = No. 29, to the right of the 'decumanus maximus' in a house. Scrap metal?	Frag. Tab. I
40.	RMD 41	133/140	? Cocceio Co[ccei f.?- - -] [Mauretania Tingitana?]	[9]Found at Volubilis during probing in the 'outhouses' of the palace of Gordian. If stratified at that level it would be 3rd century or later. The circle was pierced with a hole. Possible re-use as a lid. RE-USE!	Frag. Tab II Cut in circle
*41.	RMD I f3.	140/148	No details No surety that this is a diploma	[3]Found Alba Iulia (Partos) i.e. in legionary canabae?	Rect. frag. Tab. II
42.	RMD 45	140/148	[ex - - - - - - -]arcio Nab[- - f.] [Britannia?]	'Found' Cirencester, supposedly with a group of 9 mirrors at the corner of Church Street and Watermoor Road. Doubts have been cast on the authenticity of the find as a group (Lloyd-Morgan 1983). RE-USE!	Frag. Tab. II Cut in circle
43.	16.182	156 (Dec. 10)/ 157 (Dec. 9)	No details Maur(etania) Ting(itana)	[10]Found Volubilis	Frag. Tab I
*44.	16.181	156 (Dec.10)/ 157 (Dec. 9)	No details Mauretania Tingitana	[10]Found at Banasa in 1949, 'going towards the forum' in similar terrain to many of the other fragments. Cf. Thouvenot (1951).	2 joining frag. Tab. I

TABLE I (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
*45.	RMD 52	158 3rd Nund.	ex pedit[e] Ahucconi Leub[- - - f.] coh. I Pannon(iorum) et. [Delmat(arum)] [Germania inferior]	Found at Xanten during work on the colonia in the upper layer of humus and building rubble. According to C. B. Rüger it lay in the area of a bronze-working factory and the piece of diploma was probably intended to be melted down.	Rect. frag. Tab. I
46.	16.130	24.6.154 or 159	[ex - - - - - - - - - -f., Satu]rnino Glevi. [coh. I fid(ae) Va]rdul(lorum) (milliariae) [Britannia]	Found Colchester, in the grounds of St. Mary's hospital, to the west of the town outside the Balkerne Gate. It may have come from a cemetery or the town rubbish tip. The unit of the veteran was in N. Britain. He came from Gloucester but presumably settled in the colonia at Colchester.	Frag. Tab. I
*47.	RMD 53	159 [Dec.?]	ex dec[urione] Ti. Claudio M. f. Id[- - -] et Senecae f. eius alae I Aug(ustae) G[allor(um)] [Mauretania Tingitana]	[11]Found Volubilis	Rect. frag. Tab. I
48.	RMD 54	159 Dec. 2-5?	No details [- - - - - - - - - -] sag(ittariae) [Mauretania Tingitana]	[11]Found Banasa.	Frag. Tab. II
49.	16.111	159 (Dec. 10)/ 160 (Dec. 9)	No details Moesia superior	Found Guselia near (Bononia). Bononia was the site of a fort but also a port for Sirmium on the Danube.	ca. 1/2 Tab. I

50.	RMD 56	138/161	No details [Mauretania Tingitana]	[12]Found Volubilis.	Frag. Tab. I
51.	RMD 57	138/161	No details [Mauretania Tingitana]	[12]Found Banasa Re-used as a lid. RE-USE!	Frag. Tab. I Cut in circle.
52.	16.116	145 or 154/161	No details Province unknown	[6]Found Brigetio	Frag. Tab. I
53.	RMD 107	161 (Ian. 13 - Mart. 7)	ex pedi[te Ze(-)i G[- -]ts? [f.] coh. I Ituraeorum [Mauretania Ting]itana	Found during excavations on the site of Baelo Claudia, near to Tarifa, Cadiz in 1983. Baelo lay within the conventus of Gades, and Pliny refers to it as the oppidum nearest Tingi (NH 3, 1, 7; & 5, 1, 2). The recipient had left the province in which he had served.	Frag. Tab. I
X54.	RMD 108	126/161?	ex[- - - -] Lucio Terti f. [Noricum?]	[2]Found with Nos. 37 & 63 at Acker bei Stein, in the general area of Lauriacum.	Rect. frag. Tab. I
*55.	RMD 111	161 (Mart. 7/ Dec. 9)	No details [Moesia superior or inferior?]	Found in the modern village of Dubravica, on the Danube (Margum). Margum eventually became a municipium, but was an important town by the reign of Hadrian.	Rect. frag. Tab. I
56.	16.118	162	[ex - - - - -] Asuodane R[- - - f., - - -] cohort. I Fl(aviae) Canat[henorum milliariae] [Raetia]	Found Rome on the banks of the Tiber, in 19th century	Rect. frag. Tab. I
56a.	See Table II, No. 7				
57.	16.120	18.2.165	ex pedite, Valerio Valeri f. Valenti Ratiar(ia) cohort. I Pannonior(um) [Moesia superior]	Reported as from Padua (17th century) but precise findspot uncertain.	Tab. II nearly complete.

TABLE I (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
58.	16.186	165	No details [Mauretania Tingitana]	[13]Found Banasa	Rect. frag. Tab. I
59.	16.123	5.5.167	ex gregale, Oxetio Naevionis f. Erav(isco) alae I Thrac(um) veter(anae) Pannonia inferior	[2]Found Aquincum	Tab. I & II
60.	RMD 67	23.8.166 or 167	No details (coh. I. Fl. Numidarum) [Lyci]a et Pamphylia	Found Nicopolis ad Istrum, a municipium at least from the reign of Hadrian. The unit had earlier been in Moesia inferior and the recipient had presumably made the long journey home from Asia Minor.	Frag. Tab. I
61.	RMD 123	1.4.179	ex peditibus! Ulpio Ulpi fil. Herculano, Stobis cohor. III Campestr(is) Dacia superior	Found in 1980 within the area of the municipium of Drobeta. Coh. III Campestris was stationed at the fort at Drobeta. The veteran was foreign to the province.	Tab. I & II
62.	Lenoir-b, post 157 1983-4		No details [Mauret]ania Tingitana	[13]Found Volubilis?	Frag. Tab. I
X63.	RMD 125	ante 203?	No details	[3]Found with Nos. 37 & 54 at Acker bei Stein in the area of Lauriacum.	Tiny frag. Tab. II
*64.	Eck/Wolff 1986	31.8.203.	ex pe[dite - -]ienna Cel[- - f?] [- -]opunti[- -] [coh. V]II Breucor(um) [Pannonia inferior]	[2]Found in the area of Viminacium in Moesia superior. There is insufficient evidence to say if the veteran was returninghome, but the diploma was not in the province in which he served. Long journey?	Rect. frag. Tab. II

65.	RMD 134	223/235[Ian. 7]	No details Eqq. sing. Aug.	Found during excavation at Zalalövö in 1980, among rubbish on the floor of a hypocaust, in Room XIV of a 4th century building ('villa publica'). If discharged in Italy, a long journey.	3 frags. Tab. I joining
65a.	See Table II No. 8				

TABLE II

Auxiliary diplomas found in graves, or hoards, or carefully preserved

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
1.	16.3	18.6.54	equiti, Romaestae Rescenti f. Spiuro alae Gallorum et Thraccum Antiana(e) [Syria]	Found in a tumulus near a bridge on the road from Sarsânlar to Tata Atmagea, with other objects including pottery and flints. At a distance of about 45 km SW of Silistra (Durostorum). The recipient appears to have returned to his homeland from service in the east. (Long journey.)	Tab. II now lost.
2.	16.28	20.9.82	ex peditibus, L. Valerio L. f. Pudenti, Ancyr(a) cohort. I Aquitanorum Germania/Moesia	Found at Debelec, ca. 5 km SW of Veliko Târnovo, in a grave (Moesia). Part of the army of Germania was transferred to Moesia but not coh. I Aquitanorum. The recipient was from Ancyra in Galatia and was foreign to the province.	Tab. I & II
2a.	See Table I No. 7				

TABLE II (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
3.	16.56	24.11.107	ex pedite, Lovessio Maximi f. Bracar(i) cohort. IIII Sugambrorum Mauretania Caesariensis	Found at Cherchel, near the gate leading to Algiers. In a tomb with a piece of bronze plate in the shape of an axe and fragments of plaques which may have served as a case for the diploma. The veteran came from Spain and may be counted as foreign to the province.	Tab. I & II
4.	16.61	1.9.114	ex gregale, Nertomaro Irducissae f., Boio et Custae Magni fil. uxori eius Aquin(co) et Victori f. eius et Propinquo f. eius et Bellae fil. eius alae Frontonianae Pannonia inferior	Found in the cemetery at Carnuntum in 1853. It is said to have still been fastened. The veteran had served in a neighbouring province and perhaps returned to his home terrain. (It is not certain to which branch of the Boii the recipient belonged).	Tab. I & II
4a. See Table V No. 7					
5.	16.96	9.10.148	ex pedite, Attae Nivionis f. Azalo coh. I Ulpiae Pannonior(um) Pannonia superior	Found in the village of Aszár in 1885, in large bronze vase, stamped with the letters CARATVS V, together with gold and silver decorations. Aszár is ca. 30 km SE of Györ (Arrabona) in Azalian territory.	Tab. I & II
6.	16.106	156 (Dec. 10)/ 157 (Dec. 9)	[ex gregale, - - - - - - - -] [alae I U]lp(iae) singul[arium] Syria	Found Gabarevo, near Kazanlyk, in a cremation urn with ash and burnt bone. Probably a Thracian returning home. Long journey. See Tab. VI Nos. 13, 14, 15.	ca. 1/2 Tab. I
7.	16.119	164 (early)	No details but cohor[t]. Province unknown	Found in building operations in Jacobergasse, Vienna, in 1910. It was found together with a denarius of Julia Domna (200/211) in a stone sarcophagus.	Frag. Tab. I

				Either the veteran lived to an advanced age, or the diploma had been buried with a descendant. The sarcophagus is reported to have been ransacked by workmen and other fragments may have been lost.	
8.	16.146	7.1.237	ex equite Dominorum N. N. Aug. M. Aurelio Mucatralis fil. Zerula Ulp(ia) Serdica ex Thrac(ia)	Found near the village of Prodanovci in an ancient (probably Roman) cemetery, now called Ornice, lying NW of Samakov on the river Isker. The cemetery lies on the north side of a Roman road, and in this same cemetery were found coins ranging from Caracalla to Julian. It lies perhaps within the territorium of Serdica. If discharged in Rome the veteran made a long journey home.	Tab. I

TABLE III

Auxiliary diplomas found in military sites

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
1.	RMD 2	24.4.75	pediti, Herae Serapionis f. Antioc(hia) coh. I Raetorum Moesia	Found August 1966 in Tower 16 in the southern rampart of the fort at Taliata (Donji Milanovac). Under a mortared surface beneath a layer of earth, by the north wall were two bronze tablets. With them were other bronze objects including part of a patera handle, and one curved and two flat strips. The fort may have been occupied from late 1st to 3rd century, but is now submerged due to the hydro-electric works at Turnu Severin. The hoard may be that of a bronze worker but the recipient was in any case foreign to the province.	Tab. I & II
			Serving soldier.		

TABLE III (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
2.	16.26	13.6.80	ex peditibus Soioni Muscelli f. Besso cohort. I Montanorum Pannonia	Found in the praetentura of the fort at Klosterneuberg in 1838. Coh. I Montanorum may have been stationed here at this time (cf. Table VI. No. 8). The veteran was foreign to the province.	Tab. I & II
3.	16.41	Jan. 97	No details Unit [- - - -]lorum. [Moesia inferior]	In the ruins of the Roman fort at Salsovia, near Mahmudia, in 1907. Mahmudia lies in the Danube Delta, east of Tulcea; i.e. Moesia Inferior.	Tab. II frag.
4.	16.160(S)	11.8.110(106)	pediti M. Ulpio Adcobrovati f. Novanticoni, Ratis. coh. I Brittonum milliariae Ulpiae torquatae p.f. c. R. Dacia	[1]Found by a peasant in 1939 in the middle of the fort at Porolissum, together with No. 5. The recipient, from Leicester in Britain, was foreign to the province.	Tab. I & II
5.	16.163	2.7.110	ex pedite M. Ulpio Sacci f. Longino, Belgo, et Vitali f. eius. coh. I Brittonum (milliariae) Ulpiae torquat(ae) c. R. Dacia	[2]Found together with No. 4. The veteran was foreign to the province.	Tab. I & II (corrosion)
X6.	RMD 85	27.6.112	[- - - -] co[h- -] Batavo[rum] Province unsure.	Found by a collector either in or near the fort at Dambach. Cf. Dietz (1982) for the suggestion that this is a veteran making the long journey back from Moesia inferior.	2 Frags. Tab. I
7.	RMD 13	c.105/114	No details [Mauretania Tingitana]	[1]Found at Thamusida (M. Ting.) at the southern end of the intervallum to the east of the fort. ca. 10 m from the SE angle. Coins found suggest that the fort was occupied from the time of Marcus, but there is at least one inscription from the reign of Titus.	Frag. Tab. II

X8.	16.172	ca. 115? Nov.	[- - - - - - -]is f. [Germania superior]	Found in Stockstadt fort in association with early Antonine potsherds, wire fibulae and unworked iron. It was in a crucible and presumably this was a metal-worker's workshop. Stockstadt fort was held from Domitianic times until at least the latter part of the 2nd century.	Tiny frag. of Tab. I
X.9	16.62	8.9.117	e[x pedite] Cn. Cornelio[--] et Pra[--] coh. II Raetoru[m c. R.] Germania superior	In the Roman fort at Wiesbaden. In a hole within undisturbed loam under the eastern enclosure wall of the fort. Found in the same area as a curved tile and 7 fist size catapult balls of burnt clay, a deer bone, a pair of roof nails, a small priapus, a semi-circular plate, two bronze nails and a rhomboidal plate. The diploma was in pieces and lay in a spread of ash and charcoal and had been subjected to heat. It had been broken in antiquity and the edges of the break were blunted through melting. It was suggested that the metal worker did not think these scraps worth picking up. The fort was occupied by coh. II Raetorum from ca. 100, but abandoned by ca. 122 at the latest.	ca. half Tab. I
10.	16.166	28.3.118	[e]x gregale [- - - - - -]loni f. Flavo, Virovesc(a) (Hisp. Tarr.) [alae - - - - -]nae c. R. [Mauretania Tingitana?] OR [alae - - -]cae c. R. (ILM) [Unknown province]	[2]Found at Thamusida. Probably within the southern sector of the fort near the praetorium. The veteran came from Spain. Euzennat & Marion (1982, no. 285) suggest that the diploma may relate to another province, perhaps Spain. In either case foreign to the province.	ca.1/2 Tab. I
11.	RMD 17S	29.6.120	Barici Male f. Palmyr(a) Palmyrenis sagittariis ex Syria Dacia superior	[1]Found in 1929 on the inside of the left bastion of the fort gate near the porta principalis of the fort at Căsei. Foreign to the province.	Tab. I & II

TABLE III (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
12.	16.68S	29.6.120	Hamasaeo Alapatha f. Palmyr(a) [Palmyrenis sagittariis ex Syria] [Dac]ia supe[rior]	Found inside a fort at Porolissum. Palm. sag. numerus is attested at Porolissum (III 837, 803). Foreign to the province.	Frag. Tab. I Most Tab. II
X13.	RMD Fr. 2 S	[29.6.120?]	[No details, suggested as RMD 17]	[1]Found Romînasi with Nos. 14 & 44 Metal working hoard?	Frag. Tab. I
X14.	RMD 20	c.118/122	[ex - - - - - -M. U]lpio Landion[is f. - - - - -, et - - -]acherae Anma[ti fil(iae) uxori eius? et - - -]aro f. eius et Sur[- - - f. eius, et] Solorigi f. eius, et Cr[- - - -] f. eius, [et] Suruccae fil. eius. [Dacian province?]	[2]Found in the fort at Romînasi. Several other diploma fragments of differing dates were found in association with this which may indicate that they were all part of a metal working hoard ready for melting down. See No. 44 for latest date [27.1.164].	Frag. Tab. II
15.	RMD 21	10. 8. 123	ex gregale Glavo Navati f. Sirm(iensis) et Iubenae Bellagenti fil. uxori eius, Eravis(cae) ala I Brit(t)onum c. R. [Dacia Po]rolis(s)ensis/ Pannonia inferior	[1]Found Gherla in the ruins of the fort in the south eastern sector together with sherds of pottery and the tip of a lance in undisturbed soil. If Lörincz (1977) is correct in identifying the unit as ala Brittonum c. R. of Pannonia inferior, the recipient was foreign to the province, unless the diploma was taken to Dacia by a descendant.	Half. Tab. I
16.	RMD 27S	126 Jan. 31/ Feb. 12	Perhev Athenatan f. Palmyrenis sagittariis Dacia superior	[1]Found in the River Timiş near Jupa. The site of the find corresponds with the interior of the fort at Tibiscum, as the fort was later bisected by the changed course of the Timiş. Palm. Sag. num. (or part thereof) was stationed at Tibiscum in 2nd century. IDR III, 1, Nos 134, 152, 167, 170, 176, etc. Foreign to the province.	Tab. I & II

17.	RMD 28S	126 Jan 31/ Feb. 12	[- - - - -Per?]hev. f. [Palmyrenis s]ag[itt]ariis Dacia superior	[2]Found Tibiscum (Jupa) in the 'ruins' of the Roman fort; cf. No. 16. Foreign to the province.	Tab. I(f) Tab. II(f)
18.	RMD 29	126?	No details [Mauretania Tingitana]	[3]Found Thamusida in the via praetoria before the entrance to the praetorium near the angle of the southern barrack block on the ancient level. Cf. Nos. 7 & 10.	Tiny frag. Tab. II
19.	RMD 30	127 Apr. 14-30	No details [Dacia Porolissensis?]	[1]Found inside the fort at Gilau near the southern wall of a stone barrack block facing the via praetoria.	Frag. Tab. II
*20.	RMD 31	125/128	No details [D]acia Poro[lissensis]	[1]Found Buciumi fort in barrack block No. 5 Broken neatly into rectangle.	Frag. Tab. I
*21.	RMD 89	ca. 110/129	No details but family named [- -]fil eius/ [- - - -]eius. [Dacian province]	[2]Found in the fort at Buciumi in barrack block No. 2, during excavations in 1970. Nos. 20 & 21 have the same inventory number (379/1970) and may be part of the same diploma.	Tiny frag. Tab. II
22.	RMD 35	2.7.133	ex pedite Sepensto Rivi f. Pannon [Cornac]. coh. I Britannicae (milliariae) Dacia Porolissensis	[2]Found in August 1960 in the praetentura of the fort at Gherla. The garrison of Gherla in the Hadrianic period is still unsure. The unit of the recipient is said to have been at Căsei but the evidence is late 2nd century. The veteran was foreign to the province.	Tab. I
*23.	16.80	16.10.134	No details Germania superior	Neckarburken. In the store room under the sacellum of the east fort.	Over 1/2 Tab. I Neatly broken
24.	16.85	117/138	No details	[1]In the fort at Eining.	Tiny frag. Tab. I

TABLE III (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
25.	RMD 92	117/138	No details [Dacia superior?]	Found during excavations at Veţel (Micia) in August 1976, inside the fort, in the middle of the west side, about 6 metres from the wall of the fort, in humus over the rampart at a depth of ca. 30 cm.	Tiny frag. Tab. ?
26.	Seitz 1988a	122/138	No details [Raetia]	Found in a ditch by a street to the east of the principia at Aalen.	Small frag. Tab. I
*27.	RMD 58/95	ca. 140/144	[ex - - - -] Rutoni? and wife or child Mat[- - -]? [coh] III Bra[caraugustanorum] [Raetia]	Found on two separate occasions in the area of the fort at Theilenhofen. Both fragments showed traces of burning. The unit of the recipient was in garrison at Theilenhofen.	Two frags. Tab. I
28.	RMD 97	146 (Jan./Mart.)	[A]mandio [- - - -f.?] [co]h. I Tun[grorum milliariae?] [Britannia?]	Found during excavations at the fort at Chesterholm (Vindolanda) in 1980. In a rubbish deposit dumped over a demolished building on the eastern rampart of the fort, about 20 m. from the NE corner. Perhaps recruited locally.	Two frags. Tab. I
29.	16.93	145 (Dec.10)/146 (Dec.9)	No details Britannia	[1]Found in the eastern room of the South gate of the fort at Chesters among debris about 4 ft above the level of the original floor together with 16.115 = No. 36.	Two frags. Tab. I
30.	16.94	147	No details [Raetia]	[2]Found in the fort at Eining in the SE corner of a late building (Pius – ca. 233).	Small frag. Tab. I
*31.	RMD 47/ 101	27.9.154	ex pedite Ivonerco Molaci f. Britt(oni) coh. I Ulpia Britton(um) (milliariae)	Found in the fort at Mehadia during the excavation of the bastion of the SW corner on the north side, 20 cm from the wall and 150 cm deep in the yellow earth filling.	2 separate frag. Tab. II

			[Dacia Poroliss]en(si)	Found September 1943. The second fragment was found among material from this excavation in Cluj Museum. The unit occupying Mehadia at this time has not yet been identified but the veteran was foreign to the province.	
*32.	16.110	27.9.154	Details as in No. 31 Part of the same diploma.	Found in 1828 in a small Roman fortification along the limes between Domnasea and Peregova, 'above Mehadia'.	Half Tab. I
33.	RMD 48	28.12.154	[ex - - - - -] [- - - - S]everi f. Lusit(ano) [- - - - - - - - - - - -]r. Mauretania Tingitana	Found Souk-el-Arba in excavations which uncovered a small fort. This fort is thought to have been surrounded by a large town. Coins, lamp-sherds, and a piece of flat tile with the inscription EX FIGVL CAES N. were found with the fragment. The veteran was foreign to the province.	Frag. Tab. I
*34.	16.107	13.12 156 or 157	ex pedite Barsimo Callistenis f. Caes(area) coh. I Vindelicor(um) (milliariae) [Dacia superio]r	[3]Found in 1851 at Jupa, where the fort of Tibiscum has now been located. Tile stamps of the cohort have been found at Jupa. The veteran from the East was foreign to Dacia	2 frags of Tab. I & II
35.	RMD 109	ca.138/161	No details [Dacia Porolissensis?]	[3]Found at Buciumi in barrack block No. 5 in 1968. (See RMD 128 = No. 51)	Tiny frag.
36.	16.115	140/161	No details [Britannia]	[2]Found with 16.93 (No. 29) at Chesters.	Tiny frag. Tab. I
37.	RMD 61	161/163	No details [Raetia?]	Found in walking over the fields of Biburg near Pförring, within the cavalry fort.	Tiny frag. Tab. I
38.	RMD 114	161/163	No details [Moesia superior]	Found in the area of the legionary encampment at Viminacium.	Tiny frag. Tab. I

TABLE III (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
39.	RMD 63	[21.7].164	ex equit[e] Mucatrali Bit[hi f.] cohort. I Brit<t>on(um) (milliariae) [Dacia Porolissensis]	[2]Found Căsei (Samum; cf. No 11. The exact findspot was unknown to Forni (1958) but it was found in the same excavation as No. 11 in 1929 so probably came from within the fort. The recipient bears a Thracian name and was a foreigner in Dacia.	ca. 1/4 Tab. I
40.	RMD 64	21.7.164	ex gregale Acilio Sabini f. Dubitato, castr(is) alae Silianae c. R. Dacia Porolissensis	[2]Found in the fort at Gilau during excavations in 1951. In the wall to the right of the south gate, inside tower 13, at a depth of 0.9 m. The two tablets were welded together perhaps as a result of fire. Ala Siliana garrisoned Gilau.	Most of Tab. I & Tab. II
*41.	RMD 65/ 115	[21.7].164	No details [Dacia Porolissensis]	[4]Found Buciumi – RMD 65 found in barrack block No. 2, 1971; RMD 115 found in barrack block No. 5, 1966. Part of the same diploma.	Two frags. Tab. I
*42.	RMD 66	[21.7].164	[ex]gregale [- - - -]iti f.[- - - -] [alae Siliana]e c. R. [Dacia Porolissensis]	[5]Found in barrack block No. 5 at Buciumi, in the area of the longitudinal axis. Buciumi lies ca. 50 km NW of Gilau. See No. 41 for the possibility that this is part of the same diploma.	Rect. frag. Tab. I
*43.	RMD 116	[21.7].164	No details [Dacia Porolissensis]	[6]Found in the fort at Buciumi in 1976, near the south wall of barrack block No. 6.	Rect. frag. Tab. I
X44.	RMD 117 = Frag. 3 RMD 17	[21.7.164]	No details [Dacia Porolissensis]	[3]Found with other fragments at Românasi Cf. Nos. 13 & 14.	Tiny frag. Tab. I

45.	RMD 121	160/167	No details [Dacia inferior?]	Found in 1973 in the ruins of a barrack block in the praetentura dextra at Slaveni.	Tiny frag. Tab. II
46.	16.126	158/178	[- - - - - -]n[- -]stro[- - -] No other details	Found inside the fort at Unterböbingen in 1892; in the angle between the south and east of the fort.	2 small frags. Tab. II
*47.	RMD 122	144/178	[ex- - - - - - - - - -] Chalcid(ensi) [Dacia superior?]	[4]Found in 1978 during excavations in the fort at Jupa (Tibiscum). (Cf. Nos. 16, 17 & 34). A veteran from the East, foreign to the province.	Frag. (rect.) Tab. I
48.	16.128	23.3.178	ex equite Valerio Valeri f. Valenti castr(is) coh. I Flavia Numidarum Lycia Pamphylia	Found among rubbish at the Roman fort at Kadiköi, 'six hours from Turnovo' i.e. in Moesia inferior. Coh. I Fl. Num. was in Moesia inferior in 157 (RMD 50). The veteran had presumably returned from Lycia to his native province. Long journey.	Tab. I & II
49.	RMD 70	90/203?	No details [Raetia??]	Found in the fort at Künzing during excavations in 1964. In humus cleared by power shovels in the area east of the principia, but exact provenance uncertain.	Tiny frag. Tab. I
50.	RMD 127	109/203?	No details	Found as a stray find in the area of the fort at Pomet, Moigrad (Porolissum).	Tiny frag. Tab. II
51.	RMD 128	123/203?	No details	[7]Found at Buciumi in barrack block No. 5 in 1970.	Frag. Tab. I
52.	RMD 71	8-15.10.138/203	No details	[2]Found as a surface find near the fort at Theilenhofen. Possibly another fragment of RMD 58/95 = No. 27?	Frag. Tab. II (tiny)
53.	RMD 130	140/203?	No details	Found inside the fort at Aalen in 1981.	Frag. Tab. I
54.	RMD 72	140/203?	No details	Found in the area of the fort at Munningen	Tiny frag. Tab. I

TABLE III (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
55.	RMD I Frag. 4	ante 203?	No details	Found in the fort at Bologa during excavations in 1974.	Frag. Tab. II?
*56.	Mirković & Vasić (1986)b	230 [Ian. 7]	No details but relating to the eqq. sing. Aug.	Found in the fort at Pontes, not far from the porta principalis dextra, in a thin layer which lay between the Severan building phase and a 4th century layer. The surface of the via principalis, which was probably the result of levelling up the ground, may also be datable to the Severan period. The veteran may have returned home from Rome.	Rect. frag. Tab. I

TABLE IV

Auxiliary diplomas found in fort vici or other military settlements

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
1.	16.23	15.4.78	gregali Tertio Marti f. Trevir(o) alae Moesicae Germania Serving soldier	Found together with the bronze wires on which the seals of the witnesses would have been affixed 13 ft under the ground at Heidekrug, near the Roman fort at Wiesbaden. The fort was abandoned ca. 122 and the area became the site of a civil settlement—Aquae Mattiacorum. Cf. No. 9 Table III	Tab. I & II

1b.	See Table I No. 7				
2.	RMD 80	[20.2?]98	ex[- - - - -] [C?]iv[- -] et - - - - - - - [Pannonia]	Found Dunaújváros (Intercisa) in 1966 during excavations. It lay in a pit by a house in the vicus of the fort.	6 tiny pieces of Tab. II
3.	16.49	12.1.105	pediti, Lucconi Treni f., Dobunn(o) et Tutulae Breuci filiae, uxori eius, Azal(ae), et Simili f. eius at Luccae filiae eius et Pacatae filiae eius. cohort. I Britannicae milliariae c. R. [Moesia superior] Serving soldier	[1]Found Brigetio, in Pannonia, 1894. The recipient, a Briton, married an Azalian probably while stationed near Brigetio. He presumably returned to the territory of his wife on discharge after taking part in the first Dacian War (cf. Strobel, 1984). Foreign to the province.	Tab. II
4.	RMD 10	103/105	No details [Raetia/Moesia inf.?]	Found at Oberstimm, Inglostadt, in 1970 near the local school on ground levelled for building. This area lies within the vicus of the Roman fort.	Frag. Tab I
5.	16.55	30.6.107	ex gregale Mogetissae Comatulli f. Boio et Verecundae Casati filiae uxori eius, Sequan(ae) et Matrullae filiae eius. alae I Hispnaorum Aurianae Raetia.	[1]Found together with a number of coins, iron knives, bronze vessels and other artefacts when the railway was being constructed near Weissenburg (1867/8). The tablets were found intact with 3 strands of wire holding them together, with the ends joined on the side where the seals of witnesses were fixed. The railway lies SE of the fort and thevicus, and the diploma may have come from the vicus or from a cemetery nearby. Ala I. Hisp. Aur. was at Weissenburg in 2nd century.	Tab. I & II with wires
6.	16.164	2.7.110	ex decurione C. Petillio C.f. Vindici, Batav(o) alae Frontonianae Pannonia inferior	Found at Tokod (Pannonia inferior) near a Roman building that probably belonged to the vicus attached to the 'camp'. The man who found the plate reports that they were unearthed from the lowest layer of the ruined buildings on the bankside. A Batavian veteran foreign to the province.	Tab. I & II

TABLE IV (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
7.	RMD 86	16.12.113	ex pedite M. Ulpio Peronis f. Frontonis, Batav(o) et Mattuae Silvani fil. uxori eius Batav(ae) et Vagatrae fil. eius et Satae fil. eius. coh. I Batavor(um) (milliariae) [Pan]onnia superior	[1]Found to the north-west of Bismarkplatz during the excavations in 1977. This area lies in the civil settlement by the fort at Kumpfmühl. Cf. Dietz (1984) who suggests that it may have been an heirloom since it was buried in a level associated with the Marcommanic Wars.	Tab. I & II (corroded)
8.	RMD 88	ante 120	No details	[2]Found in 1982 among small finds from the great baths at Weissenburg.	Tiny frag. Tab. II
9.	16.69	17.7.122	ex sesquiplicario, Gemello Breuci f. Pannon(io) alae I Pannoniorum Tampiana Britannia	[2]Found Brigetio. This veteran appears to have returned home, undertaking a long journey to do so.	Tab. I & II
10.	RMD 25	ca. 121/125	No details [Raetia]	[1]Found at Straubing probably in the area of the vicus surrounding the fort. Rádnoti (1961) reported that he had been told by Dr. Kein that it came from a gravel pit at Schanzberg. Cf. 16.183 = No. 27.	Frag. Tab I
*11.	RMD 33	ca. 117/129?	No details [Mauretania Tingitana]	Found Ain-Schkour, between the river and the road to Zegotta hill.	Frag. Tab. I
12.	RMD 90	129 (Dec.10)/ 130 (Dec.9)	No details [Germania superior]	Found 1976 at Köngen, at roughly 40 cm depth within a 15 cm thick burnt layer by a mechanical excavator. Under the burnt layer was a wood and earth cellar about 2.7 m deep. In 1973, at a similar depth, roughly 2-4 m from the findspot of the diploma another earthen cellar was found. A shield boss was associated with the second cellar.	3 frags. Tab. I

13.	16.77	[2.7.133?]	No details [Pannonia superior]	[3]Found Brigetio 1897.	Frag. Tab. I
*14.	Pietsch 1990?	ca. 130/133	coh. [II Hispanorum?] [Germania superior]	Found Bad Wimpfen during excavation of a stone building in the vicus of the fort. The stone building was erected ca. 160/170 according to the excavators; i.e. after the unit (coh. II Hisp.) had been transferred to Stockstadt. The excavators noted metal-working nearby.	Frag. Tab. II
*15.	RMD 36	ca. 135	No details [Raetia?]	[1]Found at Eining during ploughing of land attributed to the vicus of the fort.	Tiny frag. Tab. II
*16.	16.174	128/138	ex[- - - -] Octavio Octa[vi f. - - -] coh. II Batavor(um) [(milliariae)] [Noricum]	Found at Mautern (Favianis) near the Roman fort in a pit associated with a Roman building with numerous finds of late 1st and early 2nd century, including pottery, a belt fastening, shoe nails etc.	Rect. frag. Tab. II
17.	RMD 42	ca. 133/140	No details [Raetia?]	[2]Found during cultivation in an estate lying SE of the fort at Eining.	Tiny frag. Tab. II
18.	RMD 98	114/146?	No details [Moesia inferior?]	Found by the Danube at Ostrov, near Durostorum. Perhaps in the canabae of the legionary fortress?	Tiny frag. Tab. I
*19.	RMD 99	140/148	[ex - - - - -] Octavio Rufo[ni. f.- -] [Noricum?]	[1]Found less than 100 m east of the fort at Traismauer (Augustiana), in the area of the fort vicus.	Rect. frag. Tab. II
20.	16.97	5.7.149	ex pedite, Dasmeni Festi f. Azalo coh. V. Callaec(orum) Lucens(ium) Pannonia superior	[4]Found Brigetio, in the town. In or near the tribal area of the veteran.	Tab. I & II

TABLE IV (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
21.	16.99	1.8.150	ex gregale, Victori Liccai f. Azalo alae I Hispan(orum) Aravacor(um) Pannonia superior 'in expedition(e) Mauretan(iae) Caesaren(sis)'	[5]Found Brigetio. The veteran had returned from Mauretania to Pannonia and to his home terrain. A long journey.	Tab. I & II corroded
*22.	16.101	153	ex gregale Secundo Sasiri f.[- - -] et Secundae Bori fil. u[xori eius] alae II Fl(aviae) milliariae p. f. [Raetia]	[2]Found in Regensburg near the Dominican Church, where the aqueduct had run, perhaps in the area of ribbon development from the vicus at Kumpfmühl. Ala II Fl. M. was at Aalen by AD 150. The veteran may have returned to the area of his service.	Rect. frag. Tab. I
23.	RMD 40	120/154	ex pedite [- - - -]men[i f. - - - -] et Seneciae Relectei [fil. uxori eius] [coh. II A]ug(ustae) Nerv(iae) Pac(ensis) [Britton(um) milliariae] [Dacia Porolissensis]	Found at Porolissum during casual digging in 1956, near a chapel on the hill of Citera on the outskirts of the village of Jac.	Frag. Tab. II
24.	RMD 102	8.2.157	ex pedite Mono Tessimari f. Erav(isco) et Niciae Tricani fil. uxo(ri) eiu(s) Canac(...) coh. I Thr(acum) Germ(anicae) Pannonia inferior	[1]Found in a building which had been destroyed by fire, lying ca. 40 m from the NW corner of the fort at Dunakömlöd (Lussonium). It was in use in the first half of the 3rd century. The diploma was burnt in the fire. Visy (1982) suggests that coh. I Thracum Germ. was not in garrison at Lussonium in 157, but may have been there ca. 131–2, when Monus was recruited. The Eravisci were local to Lussonium.	Tab. I & II Wires and box.

25.	RMD 103	8.2.157	ex pedite Culso Atedumi f. Eravsico et Vervedae Tessimari fil. ux(ori) eiu(s) Era(viscae) coh. I Thrac(um) Germ(anicae) Pannonia inferior	[2]Found in the same area as No. 19, badly burnt and very fragmentary. there is a strong probability of a kinship between the families of RMD 102 & 103.	Tab. I & II
26.	RMD 51/104	28.9.157	[ex - - - -] coh. III B[ritann(orum)] [Raetia]	[3]Two joining fragments found on separate occasions. The first was found ca. 120 m south of the SW corner of the fort at Eining, the second in the area of the vicus to the east of the fort. Coh. III Brittanorum occupied Eining from ca. 153 onwards.	2 frags. Tab. I
*27.	16.183	156/157	No details Ra<e>tia	[2]Found in a gravel pit west of the fort at Straubing near a large Roman building. Part of the binding wire was still present.	Rect. frag. Tab. I
28.	Garbsch 1988	28.9.157	[ex ped]ite [- - -]ci f. Licas. [coh I(I?) Ra]etorum Raetia	[4]Found in the vicus to the east of the fort at Eining in 1988. The stations of cohh. I & II Raetorum at this time are unsure.	Over 1/2 Tab. I
29.	6.108	8.7.158	ex gregale Heptapori Isi f. Besso alae I Gallor(um) et Bospor(anorum) Dacia superior	Found in 1886 at Cristești, which has produced a number of Roman artefacts and tile stamps of al(ae) Bos(poranorum). The fort has not yet been identified. Recipient foreign to province.	Tab. I & II some loss due to corrosion
*30.	RMD 59	154/161	No details [Raetia]	Found at Gnotzheim by a field-walker west-north-west of the fort about half-way between the fort and the modern town, within the area of the early vicus.	Frag. Tab. I
*31.	RMD 112	161(Mart.7)/ 163 (ante Sept.)	No details Raetia	[5]Found 1982 during excavations in the north of the vicus at Eining, in a drainage ditch with numerous other finds. Another fragment has since been found (Dietz 1988, 152–5).	Rect. frag. Tab. I

TABLE IV (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
*32.	RMD 113	161(Mart.7)/ 163 (ante Sept.)	No details [Pannonia inferior]	Found in the neighbourhood of the fort at Baracs (Annamatia), on the west side of Landstrasse No. 6. This lies in the area the fort vicus.	Rect. frag. Tab. I
*33.	RMD 62	163 (Sept./ Dec. 9)	No details [Pan]onnia superior	[6]Found at Brigetio during excavations south of the legionary camp. Ca. 1000 m from the SW corner of the camp there is a small late-Roman Christian cemetery. The fragment lay above a sarcophagus at a depth of 25 cm below present ground level. The excavators think that it had been dragged from a nearby building and broken by the plough.	Frag. Tab. I
34.	16.121	166 Mart. or Apr.	ex equi[te] Sicconi Iuli[- - f.] (or Secconi) coh. II Aquitan(orum) [Rae]tia	[3]Found at Regensburg in a small excavation in the vicus of the fort. Coh. II Aquitanorum is thought to have occupied a fort at Regensburg (8 Tile stamps III 6537 = 11993). There is a suggestion that the veteran was Aquitanian (Dietz et al. 1979), if so foreign to the province.	4 frags. Tab. I 1 frag. Tab. II
35.	16.125	16 or 19.12.164/ 166	ex pedite [- - - -] Simni f. Cond[ru]s(o) [coh. III] Brittonun {error for Britannorum} [Raetia]	[6]Found on a private estate either in or near the fort at Eining. The recipient was Tungrian and thus foreign to the province.	Frag. Tab. I
36.	RMD 119	ca. 156/157	[ex - - - - - - -]ciali Licati [Raetia??]	Found in the area of the vicus of the fort at Rainau-Buch, Ostalbkreis, during excavations, in a wide sewage trench with dark brown to black infill which contained additional Roman material. (Seitz (1982) suggests that the Licates were a sect of the Vindelici of Raetia.)	Frag. Tab. I

*37.	16.187	161/170	No details [Raetia]	[4]Found at Regensburg 500 m east of the auxiliary fort at Kumpfmühl.	Rect? frag. Tab. I
38.	RMD 126	90/203	No details	[6]Found in 1982 during a search of the vicus at Eining with a metal detector.	Frag. Tab. I (very tiny)
39.	RMD 129	133/203	No details [coh]ort. I Ae[l(iae) milliariae sag(ittariae)] [Pannonia superior?]	[2]Found Traismauer in 1980. If the unit has been identified correctly it was stationed at Klosterneuberg in Pannonia superior whereas Traismauer lies in Noricum. Foreign to the province?	Frag. Tab. II
40.	Seitz 1988b.	140/203?	No details [Germania superior?]	Found in the vicus at Walheim am Neckar in 1982.	Tiny frag. Tab. I

TABLE V

Auxiliary diplomas found in Roman sites, other than forts or towns, including some where the implications are unclear.

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
1.	RMD 8	105 (Mai. 4 – Iul. 13)	gregali, [- - -]o Rammi f. [- - - -] [et A]mabili Firmi [fil. uxori eius] a[la]e Classianae c.R. [Britannia] Serving soldier	Found at Middlewich, Cheshire, in 1939, during house building on the west side of King Street. There is evidence for occupation at Middlewich (Salinae) from ca. end 1st century through much of 2nd century. Probably the main industry was connected with salt.	ca. 1/2 Tab. II

TABLE V (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
2.	RMD 87	114 [Sept. 1?]	No details [Pannonia] inferior	Found 1981 in the general area of Petronell (Carnuntum). Unstratified (metal detector) find. Petronell lies in Pannonia superior. If the findspot is significant the recipient had moved to a neighbouring province on retirement.	Frag. Tab. I
*3.	16.64	116	No details Pa[nnonia superior]	Martinsberg, near Györ (Arrabona) in Pannonia superior. Found by a woodcutter, exact spot unclear.	Rect. frag. Tab. I
4.	RMD 22	123 [Aug. 10?]	No details [Dacia Porolissensis]/ Pannonia in[ferio]r	Found Covdin, 60 km SE of Viminacium. Important remains of a Roman fort have been noted not far from the findspot, on the Mlava River. Viminacium is in Moesia superior and the veteran presumably settled in neither of the provinces named in the diploma.	Rect. frag. Tab. I
*5.	16.105	122/134	[ex gr]egale, [- - - -]uli f. Frisio [et - - -]ini fil. uxor(i) eius Bat(avae), [et - - - et - - -]ellinae fil(iae) eius. [alae I Hispanor(um) Au]rian(ae) [Raetia]	Found in the fileds at Steinbrunnen in 1799, '1 1/4 hrs from Pappenheim! In Roman ruins'. Pappenheim is less than 20 km from Weissenburg, the station of ala Auriana in this period, but the veteran and his wife came from tribes of the lower Rhine and were foreign to the province.	Tiny frag. Tab. II
6.	16.175	139 (ante Nov.)	ex grega[le], Octavio Q. f. Vi[- - -]et Marricae Curin[- - fil. uxori eius, - - - -] et Octaviano [f.] eius et Octa[- - - -] alae I Thracum veter[an(ae) sagitt(ariae)] [Pa]nno[nia inferior]	Found at Albertfalva, where there is a fort with a civil settlement nearby. The find is described as being in 'vico Eraviscorum', Albertfalva lies north of Nagytétény (Campona) and south of Aquincum. Ala I Thrac. vet. sag. was stationed at Campona. The veteran probably retired to a 'native' vicus near his former fort.	

7.	RMD 39	13.12.140	ex greagle, Bitho Solae f. Besso ex numero equit(um) Illyricor(um) Dacia inferior	Found at Palamarcia (Kancalak district) in the fields. Nearby are the remains of a settlement ranging fom pre-Roman, and Roman to the Mediaeval period. The diploma was found undamaged inside a pot, together with copper wire (probably the binding wires) but was damaged by the finder, who attempted to clean it. A flat stone lay nearby and pieces of brick were scattered around. Probably a veteran returning to Thrace from Dacia—a long journey.	Tab. I & II
8.	16.178	19.7.146	ex gregale, Viatori Romani f. Asalo. alae I Hisp(anorum) Arvacor(um) Pannonia superior	Found in a Roman building near the village of Csapdi, district of Feher, ca. 30 km east of Aquincum. This lay in the territory of the Azali. It is some distance from the station of ala Aravacorum either at Arrabona or Celmantia.	Most of Tab. I All of Tab. II
9.	RMD 46	153 (late in year)	No details [Raetia]	Found in the cellar of a Roman building at Owen, at the foot of the Swabian Alb. Excavation revealed a villa. Nesselhauf (1959) was cautious about the meaning of the find but considered that the most likely explanation is that the veteran settled here. The size of the villa in the 2nd century is unknown.	Frag. Tab. I
10.	16.109	145/158	[ex - - - - - - - - - - - - - -] Titio [- - - - - - - - - - -]	Carnuntum in 1878.	Frag. Tab. II
11.	16.113	159 [Dec. 27]	[ex - - - - - - - - - - - - - -] [- - - - - -]f. B[- - - -] Pannonia inferior	Found at Adóny (Vetus Salina) by the Danube. There is a fort and civil settlement at Adóny.	Frag. Tab. I
12.	16.112	27.12.159	ex equite, Ulpio Spumari f. Biausconi, Eravisc(o) coh. I Alpinor(um) equit(atae) [Pannonia inferior]	Found at Alsószentiván, where there are tombstones and tumuli. This may either be a funerary find or from a civil settlement, a little south of the presumed station of coh. I Alpinorum, and in the tribal zone of the veteran.	ca. 1/2 Tab. I in 5 pieces

TABLE V (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
13.	RMD 55	8.2.161	ex decurione, Volsingo Gai f. Dard(ano) coh. V. Hispanorum Moesia superior	Found at Konya (Iconium) S. Anatolia. The ex decurion had both originated and served in Moesia. It is unclear how the diploma arrived in Asia Minor.	Tab. I
14.	RMD 120	160/167 Mart. or Iul. (23 or 28)	ex gregale, [- - - -] Amandi f. C[a]nnanef(ati) alae I Noricor(um) c. R. [Germania inferior]	First fragment found Nov. 1970, remainder Jan. 1971 during excavations at Monster-Poeldijk, in the ruins of a stone dwelling in which were found Roman pottery sherds and coins, including one of Gallienus. Ala I Noricorum was stationed at Dormagen (midway between Köln and Neuss) in the 2nd century. The veteran or his descendants had returned to his tribal area.	3/4 Tab. I I (3/4 Tab. II)
*15.	16.132	11.8.178–203	[ex dec/cent]urione [- - - - -] [- - - -]f. Luciliano, Porol(isso) [et - -] Secundinae ux(ori) ei(us) Bass(iana?), [et - - f. ei(us) et [- -]ano f. ei(us) et Lucidae f. ei(us) [Pannonia inf]erior	[2]Found Adóny (Vetus Salina). The veteran originated in Dacia and was foreign to the province. The special formula naming existing children of junior officers may also explain his need for a diploma. [Another fragment found at Adóny has been omitted since it is uninformative].	

TABLE VI

Auxiliary diplomas where there is a higher degree of uncertainty concerning the findspot and/or its significance.

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
1.	16.2	13.2 ante 54	equiti, Dasenti Dasmeni f. Cornac(ati), et Iorae Prosoti filiae uxori eius, et Emerito f. eius, et Turunae filiae eius, et Emeritae filiae eius. cohort. II Hispanorum [Illyricum] Still serving	In the River Save, about 25 km from Sirmium, at the place marked Sr(emska) Raca – TIR 34. Sirmium became a colonia under the Flavians but a Roman town stood there from late 1st century BC. The tribal land of the Cornacates lies in the area, but somewhat north of Sirmium. The recipient may have been in his tribal land or in territory attributed to Sirmium. Cf. No. 2 for a recipient from the same unit.	Tab. II
2.	16.4	2.7.60	equiti, Iantumaro Andedunis f., Varciano. coh. II Hispan(orum) Illyricum Still serving	Found in Vienna, but the circumstances are unclear. The Varciani inhabited an area between Siscia and Sirmium on the Save. If the recipient retired to Vienna he would have been far from his homeland. The station of the unit in this period is not known.	Tab. I
3.	16.5	15.6.64	gregalibus, Cattao Bardi f. Helvetio, et Sabinae Gammi filiae. uxori eius Helvetiae, et Vindelico f. eius et Materionae filiae eius. alae Gemellianae [Raetia or Noricum] Still serving	Found Nov. 1842 at Geiselbrechting (Noricum) not far from Traunstein. The name of the son (Vindelico) gives some indication that the province of service may have been Raetia. If so, as Helvetians, the recipient and his family were foreign to the province.	Tab. II
4.	16.6	54/68	No details Unknown province [Noricum??]	Found Wels (Ovilava)	Tiny frag. Tab. I

TABLE VI (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
5.	16.20	21.5.74	gregali, Veturio Teutoni f. Pannon(io) alae Scubulorum Germania (Upper Germany) Still serving	Found in the early 19th century in woods near the village of Sikator, which lies in the interior of Pannonia, 30 km SE of Arrabona (Györ). The recipient faced a long journey home from Germany.	Tab. I & II
6.	16.158	80 (Ian. or Feb.)	pediti, Durise Bithi f., Thrac(i) cohort. IIII Thracum Germania (Lower Germany) Still serving	Found in 1944 in the fields near the village of Kamensko, in the Razgrad district, (NE) Bulgaria. Razgrad = Abrittus and had a large fortification and town by 3rd century, but its status in the Flavian period is unclear. The recipient had a long journey to his homeland.	2/3 Tab. I
7.	16.29	9.6.83	centurioni, C. Iulio C.f. Saturnino, Chio. cohort. I Hispanorum Aegyptus Still serving	Found 1881, at Coptos in the province of service, but the recipient, from the island of Chios, was foreign to Egypt.	2/3 Tab. I ca. 1/2 Tab. II
8.	16.30	3.9.84	pediti, Dasio Dasentis f. Dalmat(ae) coh. I Montanorum Pannonia Still serving	Perhaps found at Carnuntum. The recipient was foreign to this area of Pannonia. Cf. Table IV No. 2	Tab. I & II
9.	16.31	5.9.85	ex pedite Frontoni Sceni f. Iaso cohort. I Lusitanorum Pannonia	Found Belegh (Somogyvár), in the interior of Pannonia inferior, in or near the territory of the Iasi. The recipient appears to have returned home.	Tab. I & II
10.	16.33	13.5.86	equiti, Seuthe Traibithi f. Cololetic(o)	Found Türe, (Turea) near Klausenburg in 1798, in the area which later became	Tab. I & II

			coh. II Thracum Iudea Still serving	Dacia Porolissensis. The Thracian recruit may have returned to his homeland and a descendant carried the diploma to Dacia (during the Trajanic conquest?)	
*11.	16.34	88 (Ian./Sept.)	No details S[ardinia]	Found Sorgono, Sardinia	Frag. Tab. I
12.	RMD 3	7.11.88	gregali, Dassio Dasentis f. Pannon(io) alae Phrygum Syria Still serving	Findspot unknown. A Pannonian serving in Syria would be foreign to the province. If he wished to return to Pannonia he would face a long journey.	Tab. I & II
13.	16.35	7.11.88	pediti, Bitho Seuthi f. Besso cohort. Musulamiorum Syria Still serving	Findspot Muhovo, Bulgaria, ca. 60 km SE of Sofia. This probably lay within the lands of the Bessi. The recipient presumably went home—a long journey.	Tab. I & II
14.	RMD 4	21.3.91	gregali, Quelse Dolae f., Thrac(i) alae III Thracum Augustae Syria Still serving	Found on a farm when digging foundations for a barn, Suhoz, Levskigrad, Bulgaria. A Thracian recipient returning to his homeland—a long journey.	Tab. I
15.	RMD 5	12.5.91	[grega]li, Seuthi [- - -]is f. Scaen(o) alae veterana[e Ga]ll[i]cae [Syria] Still serving	Found Gradište, N. Bulgaria, NW of Velika Târnovo. Seuthes is a Thracian name. This may represent a return to Thrace—a long journey. Cf. Tab. II No. 6. NB Nos. 13, 14, 15 may be part of a Thracian levy sent to Syria in the reign of Nero.	2/3 Tab. II
16.	16.39	16.9.94	pediti. L. Cassio Cassi f. Larisen(si) cohort. I Cisipadensium Moesia superior Serving soldier.	Found Negovanovci, Vidin district, in Moesia superior. The pedes came from Larisa, near Ephesus and was foreign to the province.	Tab. I & II

TABLE VI (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
17.	16.40	10.10.96	[status uncertain] Tunilae [- - - -]f. Cares(io) cohort. II gemin[ae Ligurum] et Corsorum Sardinia	Found in Sardinia. The recipient remained in his home terrain.	Most of Tab. I
18.	16.42	20.2.98	ex peditie, P. Insteio Agrippae f. Cyrrh(o) cohort. I August(ae) Ituraeorum Pannonia	Found Felsönána, near Vardomb. This lies in the interior of lower Pannonia. The veteran remained in the province but was foreign to it as he came from Syria.	Tab. I & II
*19.	RMD 81	98?[20 Febr?]	No details [Pannonia]	Found at Parndorf ca. 8 km south of Petronell, where an extremely large villa has been found.	Frag. Tab. I
*20.	16.43	98	No details [Britannia]	Found Flémalle, Belgium, on the banks of the Meuse. Either the recipient or a descendant undertook a long journey.	2 joining Frags. Tab. I
21.	16.45	14.8.99	gregali, Metico Solae f., Besso alae I Asturum Moesia inferior Still serving.	Found Staralastua, near Plovdiv (Philippopolis), which became the centre of government of Thrace. The recipient remained in his home-land and province of service.	Tab. I
22.	RMD 82	98/102	No details [Pannonia?]	Found near Nickelsdorf, Burgenland within the province of Pannonia and has been attributed to the province on its findspot.	Frag. Tab. I
23.	16.48	19.1.103	decurioni, Reburro Severi f. Hispan(o) alae I Pannoniorum Tampianae Britannia Still serving.	Found Malpas, Cheshire, on a farm (west of a road to Wroxeter). The decurion had served in Britain but was foreign to the province.	Tab. I & II Some loss

24.	16.54	103/105	No details [Moesia superio]r	Found Kisköszeg, by the Danube, where there was probably a Flavian fort (Ad Militare). It lies in Pannonia (inferior), and a number of units listed in the diploma had formerly been in Pannonia. The recipient was probably returning home but had to cross a provincial border to do so.	Tab. I
25.	16.50	13.5.105	pediti, Ambireno Iuvenci f., Rauric(o) coh. III Gallorum Moesia inferior Still serving.	Unknown site probably in Hungary. The recipient joined the cohort while it was stationed in Germania (superior) (Cf. 16.28). He was foreign to Moesia inferior.	Tab. I & II
26.	RMD 9	24.9.105	ex pedite, M. Spedio M. f. Corbuloni, Hippo cohort. II Ituraeorum Aegyptus	Unknown site, probably Syria. The veteran faced a long journey if he went home.	Tab. I & II
27.	16.51	105	[dec/cent]urioni, [- - - - -]nis f. [coh. - - - - -]num Britann[ia] Still serving.	In a gravel pit on Sydenham Common, Kent.	Frags. Tab. I & II
28.	16.53	ante 107	No details	Found somewhere in Dalmatia	Tiny frag. Tab. I
29.	16.57	17.2.110	ex gregale, Thaemo Horati f. Ituraeo. alae I Aug(ustae) Ituraeor(um) Dacia	Found in 'Hungary' in 18th or early 19th century. An Ituraean would be foreign to Dacia or any other 'European' province.	Tab. I
30.	RMD 14	19.7.114	ex equite, C. Iulio C.f. Valenti Trall(i), et Iulio f. eius et Valentinae fil. eius et Gaiae fil. eius coh. IIII Gallor(um) Thrace	Found Pisarevo. The recipient came either from Illyricum or from Asia Minor, in any case foreign to Thrace.	Tab. I & II

TABLE VI (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
31.	16.88	117/126?	[ex grega]le [- - - - - - -] [alae Aug(ustae) Gallo]r(um) Proculeian(ae) [Bri]tann(ia)	Found at Walcot near Bath, probably from a cemetery bordering the road running NE from Bath	Frag. Tab. I
32.	RMD 23	123 (Oct. 17 or Apr. 16?)	No details	Found near Orlea, Romania.	Tiny frag. Tab. I
33.	16.70	16.9.124	ex peditie, [- - - - -] Albani [f.] [Su]nu[c]o coh. I Sun[uc]or(um) Britannia	Found 1760, while ploughing 'The Lawns' at Stannington, Yorkshire. The Sunuci were a people of Lower Germany. Foreign to the province.	Tab. I & II Tab. I lost. Tab. II frag.
*34.	RMD 32	125/128	[ex - - -], Flavio Al[- -f.?] et Flacco f. eiu[s] et Nic[- - f. eius] et Syrill[- - - fil. eius] [Raetia]	Found at Manching in the middle of the late Celtic oppidum. It is thought to have been unoccupied in Imperial times, and the find was made in isolation.	Frag. Tab. I
35.	16.75	22.3.129	ex gregale, Eupatori Eumeni f. Sebastopol(i) et Eupatori f. eius et Eumeno fil. eius et Thrasoni fil. eius et Philopatrae fil. eius. vexillatio Equitum Illyrico(um) Dacia inferior	Found Gura Padini, east of the junction of the Olt with the Danube (Dacia inferior), with sherds of pottery, in the margin of the marshes. In view of the fact that the tablets were whole it may be that this was a case of a diploma carefully buried in a pot, or even with its owner. The veteran was foreign to the province.	Tab. I & II
36.	RMD 34	30.4.129	ex gregale, Cunio Aqui[- - -] f. Isaur(a) alae I Thr(acum vet(eranae) [Pannonia inferior]	Found somewhere in Turkey. The veteran apparently went home—a long journey.	Tab. II

37.	16.78	2.4.134	ex pedite, L. Sextilio Sextili f. Pudenti, Stobis et Lucio f. eius et Valerio f. eius et Petronio f. eius et Valenti f. eius et Luciae fil. eius et Anniae fil. eius coh. I Claud(iae) Sugambr(orum) Moesia inferior	Found Giurgu Romania. Said to have been together with a well cut rectangular stone, in a 2–3 ft hole. Giurgu lies north of the Danube from Moesia inferior where perhaps the veteran went as a trader, or his diploma was carried by a descendant.	Tab. I & II
*38.	16.83	28.2.138	ex peditie, Clagissae Clagissae f. Bess(o) et Spor f. et Derzizeno f. et Eptacento (f.) et Zinae fil. et Eptaperi fil. eius coh. II Mattiacor(um) Moesia inferior	Found 1897 at Deskotski Kladenec, near Lesicheri, Târnovo. The veteran appears to have retired to N. Thrace like other recipients (cf. No. 15, & Tab. II No. 6.)	1/2 Tab. I 1/2 Tab. II
39.	16.84	16.6.138	ex equite, Sex. Iulio Primi f. Primo, Trevir(o) et Secundo f. eius coh. I Thracum [Pannonia superio]r	Found Tooth-Vasóny (Tótvazsóny), on an estate in the interior of the province, together with a wooden case which had enclosed it (1760). The Treviran was foreign to the province.	Frag. Tab. I
40.	16.103	134/138	ex cen[turione - - - - -]to Sarabae [f. - - -] [coh.] III[?] [- - - - -] [Syria]	Found Sisak (Siscia) in the river Kupe (Pannonia superior). The diploma is attributed to Syria through the unit list. If the veteran travelled to Pannonia from Syria he had a long and arduous journey.	Frag. Tab. I
41.	RMD 94	138/140	No details Raetia	Found at south end of Oberschneiding when topsoil was being removed for a school playing field in 1981. Found within province of service.	Several frags. Tab. I
42.	16.87	22.11.139	ex pedite, Gaio Lucii f. Nicia coh. II Ulpiae Galatar(um) Syria Palaestina	Probably found at Phik by Lake Tiberias (Israel). The veteran came from Nicea in Bithynia, and was foreign to the province.	Tab. I & II

TABLE VI (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
43.	16.90	23.2.144	ex equit[e], Auleno Her[- - f. - -] coh. II Gallor(um) Pa[nn(onicae)] Dacia superior	Found north of Nova Zagora, Bulgaria, in a vineyard. The name Aulenus is considered to be Thracian, so that the veteran may have gone home crossing provincial boundaries to do so.	Frag. Tab. I
44.	16.91	145 (Sept. or Oct.)	[e]x equite, [- - - - - -]entis f. Iusto, Ca[- - -] [coh. II Astur(um)] et Callaecor(um) Pannonia [infer]ior	Found in three parts 'in Hungary' in 19th century. It appears that the veteran served in, and retired to, the same province.	Frag. Tab. I
45.	16.179	9.10.148	ex gregale, Reiodomaro Siuppi f. Eravisc(o) alae I Flav(iae) Britan(nicae) (milliariae) Pannonia inferior	Found Regöly, on the outskirts of the village, in the direction of Szárazd, on the eastern slope of a slight mound at the confluence of the Kapos and Koppány streams in the interior of Pannonia inferior. See No. 46 below.	Tab. I & II
46.	16.180	9.10.148	ex sesquipliciario, Fusco Luci f., Azalo alae I Flav(iae) Britan(nicae) (milliariae) Pannonia inferior	Found in a neighbouring plot to 16.179, in Regöly. The recipients of these two diplomas appear to have settled as neighbours on leaving the ala. One, the Eraviscan, was in or near his home terrain; the other originated in Pannonia superior and was foreign to the area.	Tab. I & II
47.	RMD 100	148 (ca. Sept./ Dec. 9)	[ex pedite] Luali Mamae f. Isaur(a) coh. I Raetorum Asia	Found in S. Turkey in 1979 with a medallion of Pius (cos. IIII). Findspot and home of the veteran agree as does the province named.	Tab. I
48.	16.104	3.11.154	ex pedite, Ursioni Busturonis f. Azalo	Found Eskö (Oskü) in the district of Vezprem (1785). (North of Lake Balaton	Tab. I & II

			coh. II Alpinor(um) Pannonia superior	and west of Székesfehérvar), in the interior of Pannonia superior). There was a settlement, a stone bridge, a dam and a grave here.	
49.	RMD 49	152/156	No details [Dacia Porolissensis?]	Found at Porolissum in the 'archaeological zone' but only noticed at the museum in Cluj among a collection of coins.	Frag. Tab. I
*50.	16.184	156 (Dec. 10)/ 157 (Dec. 9)	No details Aegyptus	Found Karanis, a surface find from the western side of the mound Kom Aushim, in Egypt.	2 Frags. Tab. I
*51.	16.117	153/157	No details [Raetia]	Found Ma'rāb, Lebanon, a little in front of Ghosta, in the area of the mountain Kesrouan. The reason for a diploma of Raetia being in Lebanaon remains unclear. It may represent a veteran returning to his home and undertaking a long journey.	Frag. Tab. I
*52.	RMD 50	ca. 157	No details Moesia inferior	Found Brestovene, district of Kubrat (N. Bulgaria), in Thracian territory.	Frag. Tab. I
53.	16.114S	138/161	No details but Mauris eq[- -] Moesia superior	Found Racari, between Turnu Severin and Craiova. In 'ruinis antiquis'. The significance of a fragment attributable to Moesia superior is uncertain, but if the recipient was 'Moorish' he, or his descendant, was far from home.	Frag. Tab. I
54.	RMD 60	154/161	No information [Syria Palaestina]	Found in Syria Palaestina.	Frag. Tab. I
*55.	RMD 110	154/161	No details [Pannonia inferior]	Found at Tajó, in the county of Bács-Kiskun, at a depth of 8 cm in ploughed land. It was handed to the museum with a mixture of Sarmatian finds. It lay outside the then 'limites' of Roman Panonia.	Frag. Tab. I

TABLE VI (Continued)

No.	Diploma	Date	Status and unit of recipient	Description of find	Condition
*56.	16.185	21.7.164	ex pedite, Sexto Busturionis f. Pann(onio) cohort. I Batavor(um) (milliariae) Dacia Porolissnsis	Found in a vineyard ca. 1 km west of the village of Palatavo, district Dupnica, Bulgaria. The veteran was foreign to the province of service, but not Thracian.	2/3 Tab. I
57.	RMD 68	167/168	No details [Raetia]	Found at Eining but the exact details are unknown in spite of an intensive inquiry by A. Radnóti. The veteran remained in the province where he served in any case.	Frag. Tab. I
58.	RMD 69	24/27.11.186	No details [coh. I] Thr[cu]m [milliariae] Syria Palaestina	Found Hebron, or nearby (Israel), in province of service.	Part Tab. I

Some fragments omitted because of lack of information. They could be fleet or auxiliary but there is nothing to be learned from their inclusion.

TABLE VII

	Long journey	Alien to province	Far from fort of service	Near home/fort of service	Re-use	Evidence for smelting	Inconclusive
TABLE I	11	14	19	2	3	6	15
TABLE II	4	2	1	-	-	-	1
TABLE III	4	16	1	29+!?	-	6	-
TABLE IV	3	7	4	21	-	-	3
TABLE V	4	3	3	3	-	-	-
TABLE VI	13	17	7	1	-	-	20
TOTALS	39	59	35	57	3	12	39

Abbreviations

BAM	*Bulletin archéologique marocaine*
BRGK	*Bericht der Römisch-Germanisch Kommission*
BVbl	*Bayerische Vorgeschichtsblätter*
CIL	*Corpus Inscriptionum Latinarum.* Berlin, 1863 –
CNRS	*Centre National de la Recherche Scientifique*
IDR I	*Inscriptiile Daciei Romane* I, ed. I.I. Russu. Bucharest, 1975
JRS	*Journal of Roman Studies*
RMD	*Roman Military Diplomas.* Occasional Publications 2 & 9. University of London, Institute of Archaeology, 1978 and 1985
TIR 34	*Tabula Imperii Romani.* Ljubljana, 1976
Tr. Z.	*Trierer Zeitschrift*
ZPE	*Zeitschrift für Papyrologie und Epigraphik*

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The Characterization of Weathering Effects and the Conservation of a Mammoth Tusk from Roxton, Bedfordshire

by HEATHER L. ECKER†

Introduction

The recent publication of an article by Alexander Marshak in *National Geographic* magazine (October, 1988) on the evaluation of a striking, male portrait head carved from mammoth ivory arouses great interest in the nature of archaeological ivory, its characterization and conservation. This palaeolithic carving raises many questions, particularly regarding the authentication of ancient ivory and its ageing properties in the burial environment.

Research into the ageing properties of ivory has been relatively sparse and not particularly directed towards the special problem of mammoth ivory. Palaeolithic archaeologists who excavate artifacts made from the material or paleontologists who study mammoth skeletal remains have little relevant literature to which to refer for information on the effects of weathering and age. Likewise, conservators concerned with the preservation of specimens will find that there are few satisfactory methods which have been applied to mammoth tusks.

The mammoth tusk under consideration here, the 'Roxton tusk' (most likely that of a female because its diameter is fairly uniform along its length), was discovered in 1976 by gravellers digging in a farmer's field in the terraces of the River Great Ouse in Roxton, Bedfordshire. According to the property owner, it was pulled out of a gravel pit on a drag line and was damaged by this and by being left outside to dry for more than a week before the curator of the Bedfordshire Museum was notified (Turner, J., pers. comm.). At some point in 1979, it was wrapped in newspapers and brought with another previously excavated tusk (Harrold, 1952 70/BMS/1) to the Institute of Archaeology for treatment. The treatment of the tusk was never completed and its fragments were relegated to the basement store of the Institute until 1988 when they were removed again to the laboratory for analysis and treatment.

The tusk was in three main pieces, the largest fragment approximately one metre long and 9 centimetres in diameter at the proximal end, the middle fragment (which was highly deteriorated and had been treated in the past with consolidating resin) approximately 24.8 centimetres long and the smallest fragment, approximately 20.5 centimetres long, which was initially thought to be part of the tip of the tusk, but is now known to fit onto the distal end of the largest fragment. Although deteriorating at its two ends, and buckling and flaking at the

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surface, the largest fragment was still quite heavy and whole. The smallest fragment was in a condition similar to that of the distal end of the largest fragment.

The aim of research on the tusk has been to begin to characterise the effects of long term burial using available analytical techniques with special attention to the structural effects and to certain common features of mammoth ivory such as black/bluish striations. These studies have been correlated with published literature on bone and teeth. Conservation aims have been to provide stabilization with as little interference as possible and to investigate the potential application of some new materials.

Pl. I. Roxton Tusk: The three main fragments of the Roxton Tusk.
Pl. II. Roxton Tusk: The condition of the smallest fragment.

STRUCTURE AND DIAGENESIS OF MAMMOTH IVORY

Mammoth Ivory—General Description

Mammoth ivory comes from the developed and elongated incisor of *Elephas primiogenius*, elephant-like mammals which, in the British Isles, lived from about 45,000 years ago until their extinction 10–11,000 years ago. Like other teeth, ivory tusks are formed from deposits of interrelating organic materials (mostly collagen fibrils, some other proteins, mucopolysaccarides and lipids) and mineral salts. The general name for the structure is *dentine* and is in distinction from related hard tissues such as enamel and bone. The outer 'bark' layer, which has a slightly different appearance, is composed of *cementum* which is calcified tissue similar to bone.

Tusk material is secreted in the living creature by generative cells, *odontoblasts*, which retreat back from nucleated sites and leave characteristic channels, *dentinal tubules*. These are a diagnostic feature of dental and ivory microstructure. In bone tissues, generative cells do not retreat and remain as inclusions in the matrices.

The dentinal tubules in mammoth and elephant ivory are organized in longitudinal columns which are articulated as waves perpendicular to the vertical direction. The wave patterns of adjacent columns are out of phase by one wavelength, and thus give rise to an optical, grid effect sometimes called 'chequerboard' or 'engine-turning'. It can be likened to a systematic form of destructive interference of electromagnetic waves. This feature is fully present and recognizable in mammoth ivory and does not disappear with degradation, as has been contended (Moraitou, 1983). Remarkably, the pattern is consistent and regular across the concentric rings apparent in the transverse section which result from the growth ultrastructure of a cone within a cone.

The configuration of inorganic material in relation to interwoven collagen fibril mats is ordered so that the mineral crystals occur periodically, corresponding to the regular banding of the coiled collagen helices. It is not clear whether the fibrils and crystals are interpenetrative or if the crystals are laid parallel, surrounding the fibrils. (Glimcher, *et alia*, 1957). There is evidence that there is bonding, particularly hydrogen bonding between amino acid sidechains of the collagen fibrils and calcium and phosphate groups in the inorganic phase.

The intimate relationship between inorganic and organic phases in bone and teeth is clearly evident from laboratory attempts to grow calcified tissues *in vitro*. Collagen extracted from soft tissues in salt solution exhibit nucleation and crystal growth only when the polymeric molecules have formed aggregate fibril groups of a certain size and thickness as found in biological systems (640 angstroms), indicating a stereospecificity between the two (Glimcher, *et alia*, 1957) and not merely a mechanical relationship. It is furthermore believed that the crystals grow epitactically on the collagen substrate pattern (Eastoe, 1967) which explains, if one imagines a layer upon layer growth, the appearance of a continuous mineral phase in mature tissues.

The degradation of both inorganic and organic phases contribute to the disintegration of mammoth ivory in the ground. Because of their individual complexity, the two phases will be considered separately.

Hydroxyapatite—Characterization and Degradation

The secreted mineral constituent of mammoth ivory has been consistently identified as hydroxyapatite, common to all teeth and bone. Variations in crystallinity, however, exist between different forms. The crystals in enamel, for instance, are much longer along the longitudunal 'c' axis than those in bone. The length of crystals in dentine is intermediate to the two. It is believed that ideally, the structure of hydroxyapatite is a long, hexagonal prism with the unit cell formula $Ca_{10}(PO_4)(OH)_2$. However, hydroxyapatite in calcified tissues exists in the form of extremely small crystallites with a seemingly irregular external form. The large surface area:volume ratio of the crystals combined with slight solubility makes biological hydroxyapatite a very reactive substance.

During life, teeth and bones are constantly dissolving and re-crystallizing. These processes certainly continue after death, to a varying degree influenced both by free internal water and burial conditions. In the case of tusks, which are for the most part external to the body, one might also consider the effects during the lifetime of a mammoth of the atmosphere, soil, snow or other contacting materials.

The hydroxyapatite in ivory, as in teeth and bone, is 'multiphased' in that some of it is non-crystalline, some distorted and non-asymmetrical and some altered by lattice substitutions and ions adsorbed onto crystal surfaces. It has also been suggested that hydroxyapatite crystals may be distorted by mechanical stress and strain along the 'c' axis (Carlstrom and Glas, 1959). The mechanism of admission of impurites into the hydroxyapatite lattices is still not completely understood.

Much of the research concerned with lattice substitutions has focussed on carbonate and fluoride ions. Both species are pertinent to the archaeological model because they are very common in burial conditions. Because of this, there has been a great deal of interest in studying the proportions of impurities in bone and teeth as a method for relative dating of the materials. Fluorine in particular has been used in this way for relative dating in the context of single site studies and was popularised in the 1950's as a result of its success in detecting forgery in the Piltdown Man remains (Oakley and Weiner, 1955).

Fluorine dating is still an interesting technique which may be profitable in some instances. Its limitations arise from local differences in soil fluorine content and from impermanence in the ion exchange. Although some researchers contend that the exchange is permanent (Chander and Fuerstenau, 1984), their *in vitro* results conflict with long term dental studies of individuals living in areas where water fluoridation was suspended. In these cases, resistance to tooth decay was quickly reduced, indicating a crystalline change (Hurny, 1978). Some degree of constant saturation level of fluoride ions would have to be present in the soil and ground water for temporally accountable exchange to take place. Obviously it would be impossible to monitor this condition for the thousands of years prior to the excavation of a biological specimen. Fluorine content, however, may be useful as a type of general index of alteration/degradation.

The proposed mechanisms of uptake of fluoride ions into hydroxyapatite to form fluorapatite are as follows:

1) At low concentrations of F, it substitutes for OH at the crystal surface such that:

$$Ca_{10}(PO_4)_6(OH)_2 + 2F^- = Ca_{10}(PO_4)_6F_2 + 2OH^-$$

It has been theorised that fluoride readily substitutes OH^- because it is smaller and fits into the lattice better.

2) At higher concentrations (>100 ppm), substitution causes partial disintegration of the lattice and calcium is adsorbed. CaF_2 forms and further disrupts the structure such that:

$$Ca_{10}(PO_4)_6(OH)_2 + 2OF^- = 10CaF_2 + 6PO_4 + 2OH^-$$

3) In another model, three steps occur: fluorapatite is precipitated, solid hydroxyapatite is dissolved. Fluorapatite is recrystallized through adsorption and ion exchange.

4) In the last model, the effect of pH is considered. The hydroxapatite is partially dissolved at pH 4, reprecipitates with F^- ions from solution to CaF_2 which transforms into the more stable fluorapatite with increasing pH. (Chander and Fuerstenau, 1984).

Models for the substitution of the carbonate ion in the hydroxyapatite lattice to form the apatite mineral *dahllite* suggest that it substitutes for the tetrahedral phosphate groups. The transfer produces lattice assymetries because of differences in size and charge between the two species (McConnell, 1965). A factor which is taken into account to describe the change which takes place is the *calcium*:*phosphorus* ratio. While this ratio is considered to be ideally 1.67 in hydroxyapatite, there appear to be some variations among species. The incisor teeth of rodents which grow ceaselessly, like tusks, have a higher proportion of dentine to enamel and a lower Ca:P ratio (Rowles, 1967). When the ratio of calcium:phosphorus increases with increased uptake of carbonate ion, dimensions in the 'a' axes (horizontal, perpendicular to longitudinal 'c' axis) tend to decrease (McConnell, 1965). The changes in the Ca:P ratio must have a compounded structurally disruptive effect at the macro-level and indeed, has been used as a gradient for measuring degradation. Other ions present in ground-water such as chloride, lead, magnesium, manganese, strontium, zinc, uranium, sodium and potassium can substitute (except for the Cl ion which is somewhat similar to fluorine) for the Ca^{2+} ion. The ratio of uranium and its products of radioactive decay has been used in some cases as a means for dating mammoth ivory (Marshak, 1988). Elemental analysis (energy dispersive x-ray fluorescence, *Link* system) of a sample section of the Roxton tusk showed a very trace uranium content. However, a preliminary confirmation using a Geiger counter inside the pulp cavity of the largest fragment did not exhibit a significantly different level of radiation than the background level of the room. Under more controlled conditions, using a sensitive counting device, it is possible that this might also be a fruitful dating technique for the Roxton tusk.

Some research has also indicated that internal lattice substitutions may take place within the lattice, i.e. 'iso-morphic' substitution between the hydronium ion (H_3O) and Ca^{2+}. Such substitutions would reduce the Ca:P ratio and might effect crystal parameter dimensions, creating distortions as carbonate substitution does. The idea that there are internally bound water molecules in hydroxyapatite such that a general unit cell formula would be $[(Ca_{10-x})(H_3O^+)_{2x}][(PO_4)_6(OH)_2]$ (Neuman and Neuman, 1958) is interesting for many reasons. Published data (Neuman and Neuman, 1958) of percentage water weight loss in hydroxyapatite against temperature (to 1000°C) shows a typical, stepwise dehydration curve which would seem to correlate with the concept of internally bound water.

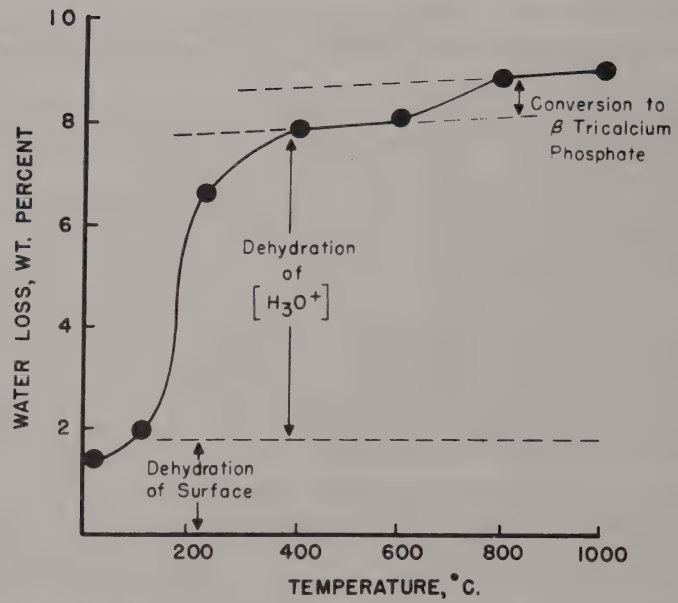


Fig. 1 Data describing the effect of calcination on hydroxyapatite (after Neuman and Neuman, 1958, 43).

Major weight loss occurs between 110 and 400°C with a relative plateau at 600°C. Betwen 600 and 800°C, there is a secondary weight loss which levels out at 800°C. Data generated by heating ivory shows a similar curve (Baer *et alia*, 1971).

Neuman and Neuman (1958) claimed that x-ray diffraction work coincident with the samples at each temperature point showed that there were no changes in structure (although patterns became sharper) until 800°C when a new pattern was identified as beta-tricalcium phosphate, $Ca_3(PO_4)_2$. They postulated that this substance was generated by structural collapse when bound hydroxyl ions were driven off between 600–800°C. Other published diffraction data is in agreement with this (Shipman *et alia*, 1984) in that peaks from calcined bone steadily become sharper between 20–525°C with an abrupt emergence of well defined peaks with little background noise at 645°C. However, it is reported with this data that no great changes in pattern occur after 645°C and indeed, the reported spectra at 940°C quite clearly shows the same pattern (see figure 2.). While it is not entirely convincing that complete structural collapse takes place at these temperatures, a dehydrated mineral would be expected.

The analysis of hydroxyapatite is difficult on a practical level in spite of the predictable results. In the process of preparing ivory for powder x-ray diffraction, one of the most powerful tools for structural assaying, the samples must be pulverized. Some researchers contend that even the heat from grinding the sample with an agate mortar and pestle may influence the structure. Likewise, storage of the material even at room temperature may have a deleterious effect resulting from dimensional change in the 'c' axial parameter. Thus for the most rigorous study, special storage and cooling equipment for grinding should be used. For

the analysis of palaeolithic ivory remains, such precautions may seem extravagant and the necessary equipment is generally unavailable. Nevertheless, results must be interpreted accordingly (Tuross, N., pers comm.).

Diffraction data of hydroxyapatite samples are difficult to interpret because of the phenomenae of diffuse peaks (so-called line broadening) in diffractometer spectra. Similar phenomenae—faint, diffuse lines on film—occur with Debye-Scherrer equipment. Both effects may be accounted for by the combined factors of the extremely small size of crystallites, the lack of symmetry in structurally defective (non-stoichiometric or substituted) areas which produce line-splitting (which appears as line broadening) (McConnell, 1965) and the effects of stress distortion (Carlstrom and Glas, 1959).

Spectra also exhibit a tremendous amount of background noise which may be attributed to the presence of amorphous calcium phosphates. Noise is not resultant as one might expect, from the non-crystalline organic fraction, as it is still apparent in the spectra of de-collegenated samples (Trautz, 1967). In addition, even spectra of pure standards of the range of apatites which may be present in archaeological ivory are so close (variation is on the order of a hundredth of a degree) that it is extremely difficult to effect a positive identification of their presence. X-ray diffraction is not particularly useful for differentiation between hydroxyapatite and fluorapatite, a subject towards which a great deal of dental and bone literature is directed. The application of Gaussian curves to try to resolve such spectra (really an attempt

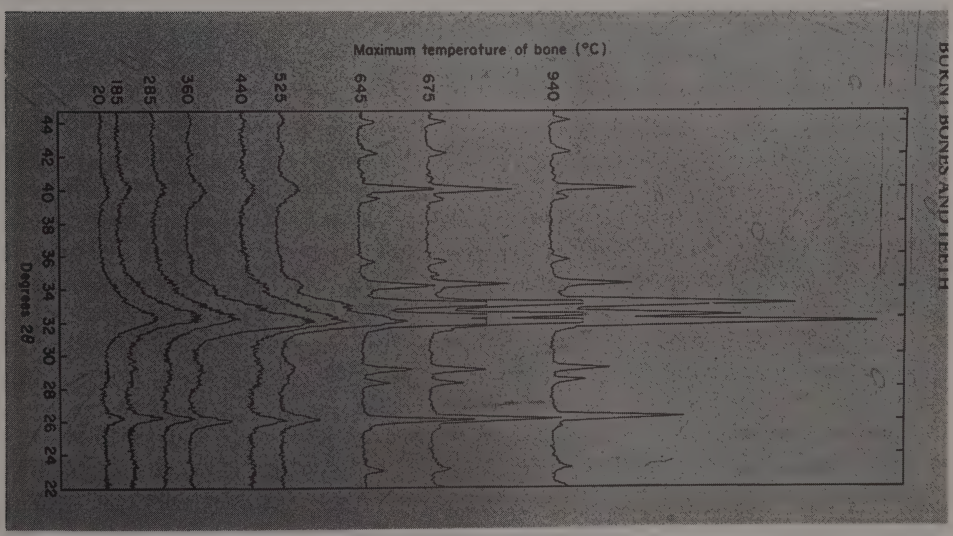


Fig. 2 X-ray diffraction patterns of incrementally heated fresh bone samples (after Shipman *et alia*, 1984, 319)

to make chaotic data more 'linear') may be a moot procedure because the effects causing diffuse data are not profitably elucidated by idealization.

Hydroxyapatite would be an ideal world for the application of chaos theory because, remarkably, in spite of all of the structural 'randomness' and disorder in our bones and teeth, relatively speaking, they do not collapse and mammoth tusks can survive in the ground for 40,000 years or more. Like the mathematics of fractals and many biological systems, mammoth ivory contains multiple levels of structural complexity and order which can be observed as magnification is increased on, say, a scanning electron microscope (Gleick, 1987). Curve fitting of diffraction data is helpful though for attempting to measure crystal size from half-maximum widths. Crystal size itself is a good indicator of the extent of alteration in hydroxyapatite. Smaller crystals are less altered and have more diffuse x-ray diffraction patterns. The crystals in the Roxton tusk ivory had very large full-width-half-maximum values and are, hence, quite small.

As previously mentioned, the diffraction spectra of hydroxyapatite from fresh bone material has been found to become increasingly sharp and more defined with the incremental application of greater amounts of heat. Spectra which begin as diffuse, noisy and having only three 'peaks' at most exhibit very sharply defined peaks (approximately fifteen) and low noise after being heated to 940°C (Shipman, *et alia*, 1984). These laboratory tests can be used as a model for the accelerated ageing of ivory and provide some groundwork for interpreting the effects of natural diagenesis.

Whilst the changes causing the increased definition in diffraction patterns may simply be due to the effects of vaporizing collagen and internally bound water, there are other effects which should be taken into account when comparing this data with that gathered from the environmentally aged Roxton tusk. The diffraction spectra of samples from the Roxton tusk most closely resemble the published spectrum of bone heated to 525°C although for the most useful comparison, a similar range of spectra might be produced from a closer model such as fresh elephant ivory. Diffraction spectra of dentine do tend be sharper than that of hydroxyapatite from bone.

The phenomenon may be considered in two ways. The explanation offered by Shipman and Forster (1984) is that heating causes recrystallization and the growth of larger crystals which give clearer diffraction patterns. The theory extended to include the parallel level of clarification in the mammoth ivory spectra (unfortunatley, fresh mammoth ivory for comparative study does not exist though it might be interesting to generate data from mammoth ivory which has been preserved in perma-frost) is helpful for modelling an explanation for evidence of physical disruption. When recrystallization occurs, old bonds are broken, crystal orientations change with respect to each other, volume changes may occur as the crystals become larger and inherent stress and strain may be relaxed. The concept of the recrystallization of ivory at higher temperatures is analogous to the known behaviour of metals.

The second approach to thinking about the phenomenon exhibited in the diffraction data is more intuitive somehow, for 'unstable' crystal systems subject to long term influences. One can attribute increased definition to the approach of hydroxyapatite to an equilibrium state. Over long periods of time, assymetric and defective structures gradually recrystallize to form regular crystals. Such an effect might result from lattice substitutions of F^- for OH^- in that

fluorine ions are smaller, fit better and hence may promote regularity. This concept is consistent with the fact that hydroxyapatite systems are known to attain equilibrium extremely slowly (Chander and Fuerstenau, 1984).

This concept of the diagenesis of hydroxyapatite is helpful in understanding why ivory (on a macro level) can survive burial for very long periods of time. It proposes that the material may undergo considerable amounts of change initially, but that these level off as a state of equilibrium, like a mathematical limit, is approached. The material then enters a period of relative stasis where it may remain indefinitely if conditions are not radically altered. Laboratory experiments to precipitate hydroxyapatite from supersaturated solutions (similar to the effects of moist burial conditions) do not result in equilibrium except after a long period of time or when heat is used (Chander and Fuerstenau, 1984). Because of the complexity of the material at hand and the variability of environmental conditions, these two paradigms and the effects of internally bound water and loss of collagen, indeed may not be sufficient for a true appraisal of the changes which occur.

Organic deterioration

The deterioration and dissolution of the organic phase in ivory has been given a great deal of attention in conservation literature because it is generally believed that the breakdown of collagen accounts for greater structural collapse. Whilst this is probably true, though inorganic change also determines the physical condition, a number of interesting effects result from organic alterations which have not previously been considered holistically. These features may be accounted for by microbial action, soil conditions and thermal history.

In general, collagen fibrils form the polymeric network holding bone and teeth together and provide resilience and some flexibility. In soil, collagen and the minor organic materials present are hydrolysed by enzymatic microbial action into smaller peptide and amino acid groups. These are more soluble than collagen and are leached from bone and ivory by ground water percolation. Chemical and mechanical bonds existing between the organic and mineral phases are thus broken and voids are left in the ivory structure. Increased porosity allows for further water penetration which contributes to crystalline transformation and dissolution. In addition, voids allow for the shrinkage of the ultra-structure during dry spells or during fluctuating wet conditions which cause cracking and physical disruption.

The rate of deterioration by microbes is determined by humidity, soil pH, the presence of oxygen, surface area and size of specimen. Smaller bones are disarticulated much more rapidly than a large and thick tusk. Humidity is a determinant of whether microbes can be activated— bones from dry environments like that in Egypt have been reported to retain their collagen for thousands of years (Ortner *et alia*, 1972). Conditions of pH vary in terms of favorability to the attack of various microbes in the soil (i.e. acidic soils are favorable for fungal colonization). Acidic and alkaline environments also contribute to the hydrolysation of collagen independently of enzymatic attack. It has been suggested that the level of retained collagen can be measured to some extent by the level of fluorescence in the ivory indicating that the fluorophores present in the organic fraction are also preserved after death (Gayathri, 1983). When examined with an ultra-violet lamp the Roxton tusk exhibited a very slight, yellowish fluorescence.

There has been some interest in the use of nitrogen, like fluorine, as an index of age in ivory. Whilst the percentage of nitrogen by weight is a guide to remaining collagen content, it cannot be used successfully for dating purposes because the rate of dissolution of collagen is dependant on many other factors and is not regular or linear (Ortner *et alia*, 1972). Furthermore, it has been found that mastadon and mammoth ivory retain almost as much collagen as is found in modern elephant ivory by nitrogen analysis (Baer *et alia*, 1978).

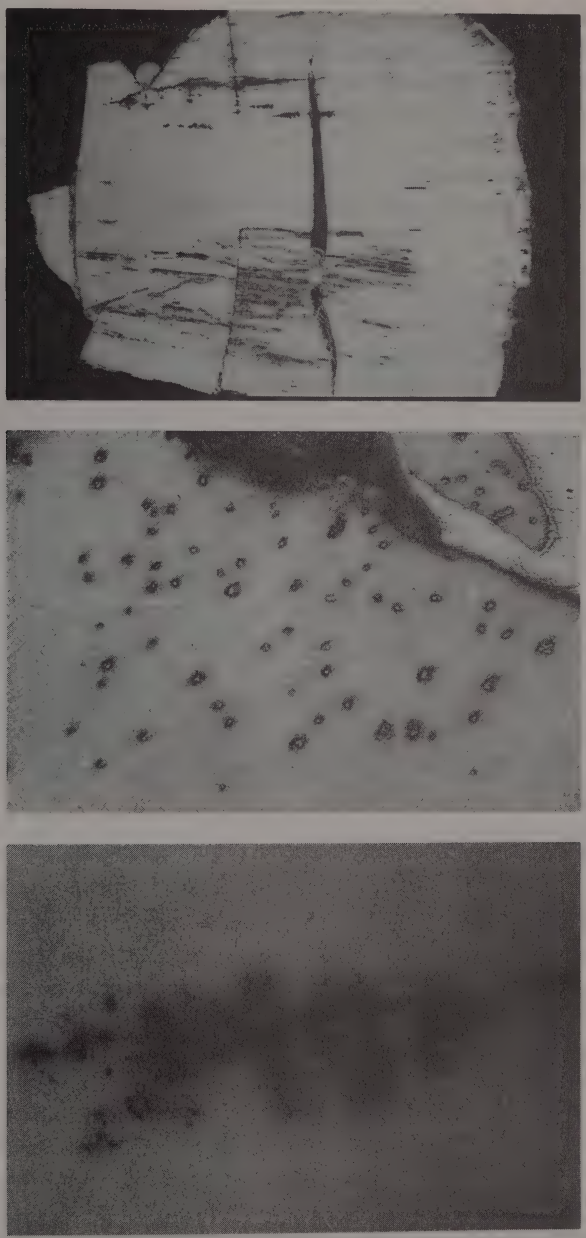
Whilst it may be that prehistoric mammals originally had a higher proportion of collagen in their tusks, this remarkable factor is more easily explained by the fact that the particular ivory samples which were analysed were unworked (hence, protected by their bulk), while Baer's comparative materials are carved, thin plaques with greater surface:volume ratios and different thermal histories. It is noteworthy that the high figures reported by Baer are not borne out by combustion analysis of the organic fraction of the Roxton tusk which indicated a very small amount of remaining organic material. One possible explanation for the discrepancy is that Baer's mammoth ivory is Siberian, which tends to be younger than British ivory. However, the effects of different climates on the ivories make the comparison more difficult and even invalid in the same way that comparisons are difficult to make between ivory from Mesopotamia and Siberia as Baer does.

Microbes, particularly fungi, enter bone and ivory, penetrating surfaces and creating tunnels and eroded surfaces. Areas of fungal invasion can be seen on polished transverse sections with an optical microscope and have the general appearance of mold in Roquefort cheese. Tunnels and fissures formed in this manner can be better documented with scanning electron microscopy (SEM). Larger insects have similar destructive effects—the *dermestes* beetle (Piepenbrink, 1986) has been suggested as such a perpetrator. In the SEM studies of surface samples of the Roxton tusk, an unidentified insect carapace was discovered, albeit of a much smaller order than that of *dermestes*. Microscopic debris on the surface and in fissures also seem to be diagnostic of fungal attack, which is consistent with findings on the Roxton tusk samples.

The most interesting effect which, it has been theorized, fungi have on mammoth ivory is to produce coloured layers: black, violet-blue and red. The Roxton tusk exhibits black and bluish colourations both as discrete layers on and between the conic sections (black) and as permeating diffusions (violet-blue). On the middle fragment of the tusk, which was somewhat conserved previously, the violet is more reddish. Comparative mammoth tusks at the Bedford Museum which were examined also exhibited reddish layers.

An analogy can be drawn between the coloured layers in ivory and the black spots occasionally found on ceramics which cannot be removed by treatment with oxidizing bleaches as iron oxides would be. X-ray fluourescence analysis, among other techniques performed by Daniels (1981) on some of these ceramics, identified the black compound as a manganese oxide or mixture of phases such as that MnO_x ($x = 1.2 - 2.0$) with MnO_2 as most likely because it is stable over a wide pH range. The theory generated from this data is that manganese (Mn^{2+}) which is ubiquitously present in the soil is converted by bacteria, algae or fungi to MnO_2, which is left as a surface residue when the microbe dies (Daniels, 1981).

Results of analysis of the exterior black layer on a sample from the proximal end of the Roxton tusk (the part of the tusk which had a greater proportion of edible organic material at



Pl. III. Polished transverse section. Colouration appears as streaks.
Pl. IV. Dendritic mould form at higher magnification
Pl. V. Spotted mould form at higher magnification.

the time of the mammoth's death), is consistent with data from the black staining on the archaeological ceramics. It has been put forward that these ceramics may have contained remains of food (Daniels, 1981). Wavelength dispersive x-ray fluorescence analysis showed a higher proportion of manganese in dark areas. Energy dispersive x-ray fluorescence analysis showed a high proportion of Mn and Fe in the samples whereas analysis of white areas showed less or no manganese and only trace amounts of iron. At higher magnifications, analysis showed greater concentrations of the metallic ions in certain dendritic and cell-like structural features (which are unidentified so far and may be organic because of visible movement under the electron beam) above the general average. X-ray diffraction of a violet-blue Roxton tusk sample showed no significant differences from a white Roxton tusk sample, although Daniels (1981) reported that diffraction studies on the ceramic black layer did not produce sharp patterns because the material was essentially amorphous.

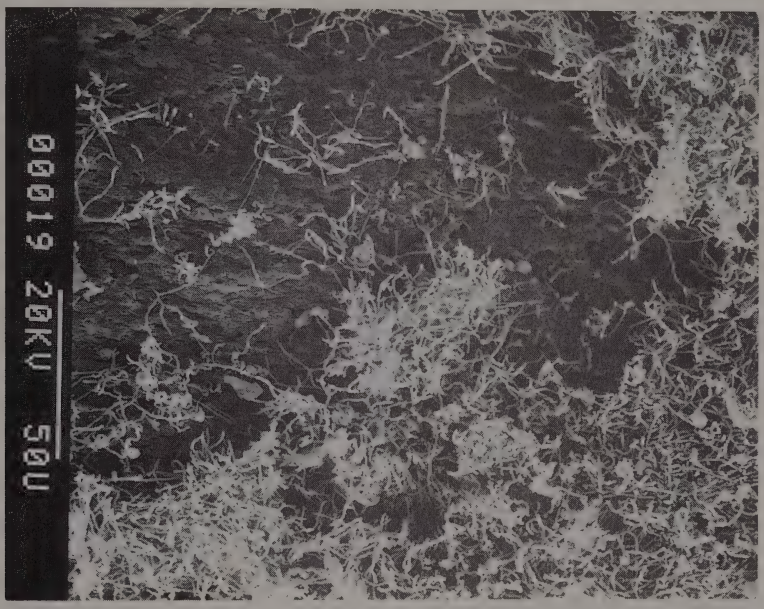
Sawn transverse sections of the Roxton tusk which initially appeared as violet-blue, exhibited black streaking in a white matrix when polished with alumina and diamond powders. With magnification under a reflected light metallographic microscope, the black streaks appeared spotty or feathery and dendritic, which seems to suggest the effects of a former fungal presence. The streaking also appeared to pre-date ultra-structural disruption as the black material is generally continuous over cracks between the conical sections. The fugitive and delicate nature of the fungal traces was further illustrated by the fact that the streaking in polished sections which had been subjected to an electron beam for long periods in the SEM became powdery, diffuse and difficult to discern when later reviewed under a metallographic microscope.

Another avenue of research was explored to explain the phenomenon of the black layers was originally published as a study of coloured stains on human bones in European crypt burials from the 7th to 18th centuries (Piepenbrink, 1986). This study strongly suggests that colouring is derived from the persistent chromophores (organic, pH sensitive dyes) impregnated into bone by fungi of the genera *Mucor* and *Fusarium*. The diffusing element comes from the normal, external metabolism of these microbes. Experimentation with varying pH showed that these stains were red in neutral solution, violet-blue with acidification and light yellow with alkalinization. The stains were found to be fluorescent with areas of fluorescence centred around microbial tunnels. These areas were also found to exhibit "improved crystallinity" in diffraction, although as mentioned, the Roxton sample diffraction pattern was not consistent with this finding. In addition, the report describes an attempt to induce staining of bone *in vitro* by the culturing of bones with the specific fungi. No staining resulted, which lends credence to the idea that the colour is derived from the oxidation of a metal ion found in the soil.

Application of this paradigm to the Roxton tusk was somewhat serendipitous. The middle tusk fragment (with a more reddish colour) had been previously treated with some kind of consolidative resin. The resin was glossy, pooled in some places, and unsightly. Tests were made to find a solvent to dissolve the resin and IMS (industrial methylated spirits—a mixture of alcohols) was found to work well. Small cotton pads moistened with IMS were placed on the surface to soften the resin. It became apparent that this procedure was inducing a change in the colour of the surface—magenta spots emerged.

In attempting to explain this phenomenon, it was postulated that the resin might be a polyvinyl acetate which is slightly acidic. Dissolution with the alcohols had allowed some of it to penetrate the ivory, thus effecting a change of pH in the material. The corresponding change in colour, although not the same sequence of changes, might indicate the presence of a persistent organic dye.

The following tests were made to stretch the observation further: 1) The magenta spots were made alkaline by applying small pads of cotton wool moistened with a dilute solution of

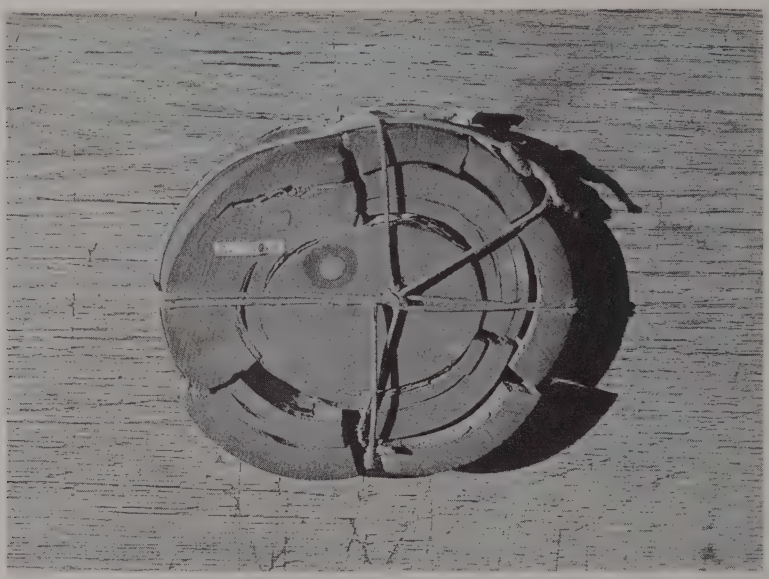


Pl. VI. British Petroleum's SEM photograph of the edge of a black area on a sample.

sodium hydroxide in distilled water. these treated areas turned black and brownish; 2) A technique for removing manganese and iron oxide stains recommended by Daniels (1981) was attempted. This procedure calls for the application of a 2% w/v solution of hydroxylamine hydrochloride ($NH_2OH.HCl$) in 1.OM HCl. This reaction produces soluble chlorides in reducing conditions which can be rinsed out of the substrate. Two small samples were selected for treatment, the first was infused with a bluish colouration and the second had a discrete black layer. The effect of a drop of the solution on the first sample was to turn it pink. The second sample effervesced a great deal (indicating a large carbonate content) and the black layer dissolved away completely. The two different results seem to point to the existence of two colouring phenomenae, one an organic 'dye' and the other, a metallic oxide.

The behaviour of the discrete black layer under reducing conditions is consistent with the analytical results showing a high manganese and iron content in this layer. However, the behaviour of the sample with more diffuse blue colouring which paralleled the development

of magenta spots on the middle fragment of the Roxton tusk is more puzzling. Two related colouring phenomenae could develop in the same tusk, perhaps through the action of different microbes. It is not known if an organic chromaphore could be retained over such a long period of time consistent with the age of the Roxton tusk. It is also not known from what period during its burial the fungal attack was active (if indeed at all). More research in this area is necessary to be truly conclusive. Independent analytical work performed by British Petroleum on some Roxton tusk samples of the black layer seem to support the evidence for a fungal



Pl. VII. Cracking and separations in a slice of Siberian mammoth ivory.

origin. Energy dispersive x-ray fluorescence analysis showed a high proportion of carbon (or possibly carbon and oxygen) in the black regions. In addition, the associated SEM photographs show a tangled mass of fibrous material which appears to be fungal hyphae. However, some caution must be excerised with regard to these findings because they were not duplicated during our own SEM investigations of the black layer.

It may be an important feature that the discrete black layers generally occur on areas of the tusk which are directly exposed to the environment and the diffuse blues are found in more internal layers. This conformation, however, may be characteristic only of local ivory, and other colouring layers, on Siberian mammoth ivory for example, may have different configurations and origins. The dark, blue-green outer layer on a Siberian tusk at the Odontological Museum, London, had tide-like, almost chromatographic lines of penetration into the ivory and did not extend inward beyond about a centimetre. North American mammoth ivory is reported to be coloured in a similar way: the colouration is thought to be resultant from the

ingress of copper salts from the burial environment (Cohen, L. pers. comm.). A mammoth ivory hunter in Siberia in 1926 described tusks which had a superficial bright blue layer, but were white on the inside (Digby, 1926). Other colourations in Siberian mammoth ivory such as a rich, fully permeating brown are thought to result from the absorption of iron salts. Some research on Near Eastern archaeological ivory has identified colouring agents as the iron oxides vivianite and haematite (Taylor, 1955; Wyckoff *et alia*, 1963).

Ultra-Structural Deterioration

Ultra-structural deterioration of mammoth ivory tusks follows a characteristic pattern. Most commonly, the features included are longitudinal cracking, buckling between cracks (especially of the bark) and separation between the conical growth layers. The curved conical layers themselves crack radially and longitudinally creating smaller, cube-like fragments, most fragments are, however, irregularly shaped. The internal proportions may disarticulate so severely in some cases so as to form a collection of disassociated fragments within a shell-like bark.

The texture of the internal portion of the tusk is dependent on the amount of remaining collagen. Those with higher collagen content will be more 'plastic' and transluscent, while those with little collagen are brittle and powdery like chalk and completely opaque. Examples of the Siberian mammoth ivory at the Odontological Museum were more like the former, although very segmented in some cases, while the Roxton tusk is more like the latter. The colour changes in mammoth ivory also are most apparent in the outer layers, the inner core being almost bleached. It is also interesting, although perhaps predictable, that the most disintegrated regions of tusks tend to be the two ends, while the centre may be quite sound. Dealers in fossil ivory who have sprung up since the ban on the importation of fresh elephant ivory (especially in the United States) tend to use material from the central sections of tusks.

The action of soluble salts is responsible in some cases for the deterioration of mammoth ivory. Such damage may be characterized by surface blistering and flaking. Surface flaking may occur for other reasons as well. The outer bark is more dense and resistant to deterioration than the dentinal corpus, but is also the surface which is most affected by weathering and erosion. The layered structure of the bark, weakened by erosion and microbial attack may be flaky without the aggravation of soluble salts.

In many cases it is clear that ultra-structural disruption is not a direct feature of the burial experience, but rather resultant from handling at the time of excavation and storage. Ivory, particularly mammoth ivory, is a porous and fragile material. It cracks, warps, shrinks and expands according to the changes in relative humidity in the environment to which it is exposed. Mammoth tusks, like the Roxton tusk, which are excavated without care and are left to the elements will suffer from this effect. In addition, the action of soluble salts is exacerbated by changes in relative humidity. In the first instance, controlling deterioration after excavation is accomplished by extremely slow drying with full physical support. In the second instance, soluble salts are immobilized by maintenance of a single, standard relative humidity, following drying to that level. A full exposition of the necessity for these precautions may be found in the section on conservation.

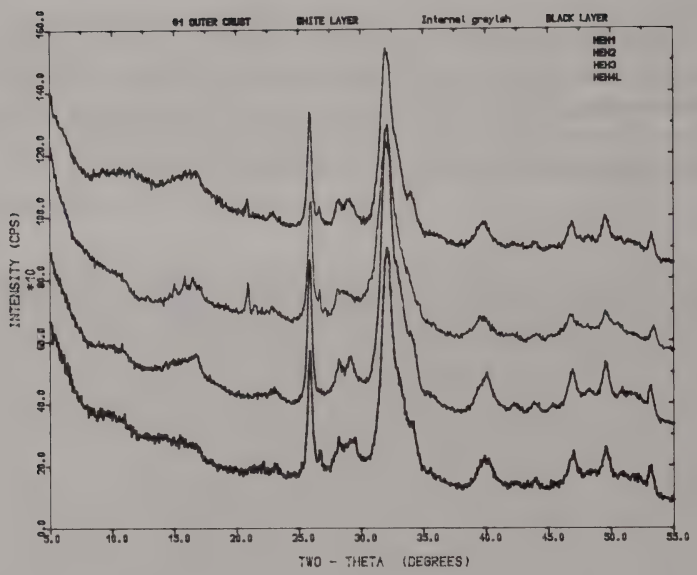


Fig. 3. Diffraction patterns obtained from the Roxton tusk samples.

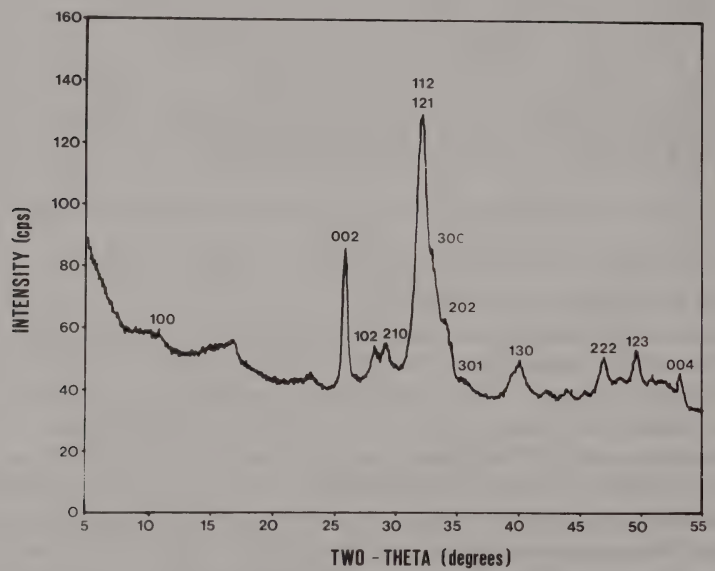


Fig. 4. A traced diagram of the pattern from the white layer (sample 2.) with the Miller indices for hydroxyapatite (Trautz, 1967; Carlstrom and Glas, 1959) indicated which illustrates the degree of line broadening in these patterns. The 002 and 004 peaks represent the 'c' longitudinal axis of the crystals.

ANALYTICAL STUDIES

X-Ray Diffraction Analysis

Powder x-ray diffraction was performed by Dr. Stephen Tarling at Birkbeck College on four samples from the Roxton tusk. The instrumentation used was a Seimens Powder Diffractometer D-500, with copper K-alpha radiation (wavelength 1.54 angstroms). The detector used was a scintillation counter, angle theta-2-theta. The sample was rotated on a silica monolith sample holder. The data was analyzed with a PDP-11 computer with the Seimens Diffrac-11 software package.

Samples were obtained by scraping and/or cleaving with a clean, stainless steel scalpel blade and were pulverized with an agate mortar and pestle. The samples represent:

1. The bark (cementum) layer.
2. A white layer between the dentinal corpus and the bark.
3. A violet-blue (infused) area from the core.
4. The discrete black layer from the proximal end of the tusk.

Discussion

The diffuse peaks, high level of background noise and line broadening illustrated in these patterns reflect the small crystallite size of the hydroxyapatite and the effects of substitution and stress distortion previously discussed. It is interesting that the peaks in the patterns for the external bark and the white layer under the bark are more intense than those of the coloured layers indicating that they (1 and 2) are slightly more crystalline. This result is consistent with the fact that these two layers have had more exposure to the environment and have probably been recrystallized to a greater degree. The result is in distinction from Piepenbrink's assertion (1986) that the degraded, coloured areas exhibit 'greater' crystallinity.

An attempt was made to match these patterns with a standard for fluorapatite, but no precise identification could be made because of the extent of overlapping. A brushite standard was also compared with the patterns because it has been asserted that this mineral is the decay product of fossil ivory (Piepenbrink, 1986), but it did not match. The two small peaks at approximately 22.0 degrees in the patterns of samples 3 and 4 were identified as part of the pattern of quartz. In order to find an indication of crystal size, an attempt was made to resolve the major peaks through application of Gaussian curves and measurement of full-width-half-maximum values. These values were very broad, quantitatively indicating that the crystal size is quite small.

Electron Microprobe Analysis

Electron microprobe analysis was carried out by David Lange and John Merkel at Harvard University (Department of Earth and Planetary Science) for the elements of fluorine, calcium, phosphorus, manganese and iron on a polished transverse section of the Roxton tusk (see Plate III) on five points proceeding from top to bottom. The reference standards for each element were apatite, apatite, apatite, rhodonite and fayalite, respectively. The sample, which was mounted in polyester resin, was carbon coated.

The instrumentation used was a Cameca MBX electron microprobe using Wavelength Dispersive Spectrometers (WDS). The instrument was equipped with a Tracor Northern TN-5502 EDS system and a TN-1310 WDS and stage automation system. The operating conditions were: beam voltage – 15 keV, beam current – 15 nanoamps, and beam size – 16 x 16 microns. The matrix correction programmes used were Sandia BA85 and Armstrong alpha-factors.

Results:

Calculated Weight Percentages

	F	P205	CaO	MnO	FeO
1. White Ivory	1.10	28.95	40.40	0.13	5.00
2. Nearby A	1.12	22.78	31.16	0.02	0.03
3. Nearby B	1.32	27.72	38.27	0.03	0.00
4. Dark Ivory	1.18	30.30	41.75	0.52	0.01
5. White Ivory	1.05	26.07	41.74	0.03	0.29

Discussion

One of the purposes of conducting this analysis was to ascertain if there was any compositional variation through the thickness of the tusk. For elements such as fluorine, which is known to readily substitute into the hydroxyapatite lattice, percentage variations might indicate whether alterations were mainly surface features or more penetrative. The percentage of fluorine from these spot analyses do not vary very widely (between 1.05 and 1.18%) and have no trend. Thus it is probable to conclude that the transformation of hydroxyapatite to fluorapatite is not merely a surface feature.

The general level of fluorine indicated by the analyses is extremely high, even for archaeological ivory. Fluorine analyses by spectrometry published by Baer, *et alia* (1978) for Siberian mammoth and mastodon ivory gave values of 0.06% and 0.02% respectively. In general, levels of fluorine in archaeological ivory seldom rise above 0.5%. Therefore, although fluorine content is not reliable as a dating method, *per se*, one can probably conclude with safety from these results that the Roxton tusk ivory is of great age.

The calcium/phosphorus ratios, which can be roughly calculated here by dividing the percentage of CaO by that of $P_2 0_5$ for each point, do vary however. The values from points 1–5 are 1.40, 1.37, 1.38, 1.37 and 1.60 respectively. It is interesting that the most internal point has the highest Ca:P ratio. The variations in the Ca:P ratios indicate that some crystalline transformations have taken place in the hydroxyapatite such as substitution by carbonate ions. The difference between the percentage value here for the phosphate group and the result gained from the micro-combustion analysis for phosphorus illustrate how qualitatively bulk and surface methods may yield different values and are not necessarily comparable. The percentage values for manganese oxide content are significant in that the dark ivory (black streaking) has a much higher level of manganese than the general average. It is interesting also that the first point in an area of 'white' ivory also had a higher manganese content. That this point also had an extremely high iron content is also curious. The level of iron in other

areas (except point 5) is very low. That the iron content should be greatest in areas of 'white' ivory (uncoloured) is puzzling because iron oxides are known to 'stain' ivory. The low level of iron oxide in the dark band also does not correlate with the energy dispersive analyses which indicated a high level in the coloured areas analyzed.

From these analyses, it can be concluded that a great deal of environmental alteration has taken place in the Roxton tusk ivory, that it is of great age and that higher manganese content of the dark band provides some evidence for the cause of the coloured layers.

Micro-Combustion Analysis

Micro-combustion in oxygen was performed by Dr. Alan Stones at University College, London, on a sample from the white core of the largest fragment of the Roxton tusk to measure the carbon, hydrogen and nitrogen content. Phosphorous content was determined at the same time spectrophotomatically by percentage of a phosphor-molybde-vanadium complex. The remaining ash content was measured after combustion. The sample was obtained by cleavage from a larger fragment which was unattached, but inside the tusk.

Values below 0.20 are reported as negligible because they fall within the standard deviation range for analytical error. The results of these analyses are compared with data published by Baer *et alia* (1978) for fresh African elephant ivory and mammoth ivory from Siberia.

Results:

	C(%)	H(%)	N(%)	P(%)	Ash(%)
Roxton Tusk (Britain)	1.75	1.34	—	16.32	85.00
Elephant Tusk (Africa)	16.25	3.51	5.52	—	53.32
Mammoth Tusk (Siberia)	15.64	3.78	5.37	—	54.24

Discussion

The values representing the carbon, hydrogen and nitrogen content of the Roxton tusk are very low, indicating that there is very little collagen remaining in the structure. It is interesting that the Siberian mammoth ivory yielded such high values — close to those for modern ivory . One can possibly attribute the difference to age in that British ivory tends to be older than Siberian ivory, although not necessarily so. There were two periods of mammoth habitation during the Upper Pleistocene Epoch, approximately 30–40,000 years ago and 12–11,000 years ago, that extended across many parts of northern Europe, North America and Siberia (Sutcliffe, 1986, 103–116; 138–9). More likely, the difference reflects the thermal histories of the ivories. Many parts of Siberia have been permanently frozen (under permafrost) since the Pleistocene Epoch. These conditions probably account for the greater state of preservation of the Siberian ivory (Sutcliffe, 1986, 105). The combustion data for the Roxton tusk is consistent with the results gained from comparison of Roxton material with modern elephant ivory by differential scanning calorimetric analysis.

Thermal Analysis

Thermal analysis by differential scanning calorimetry was carried out by Marianne Odlyha at

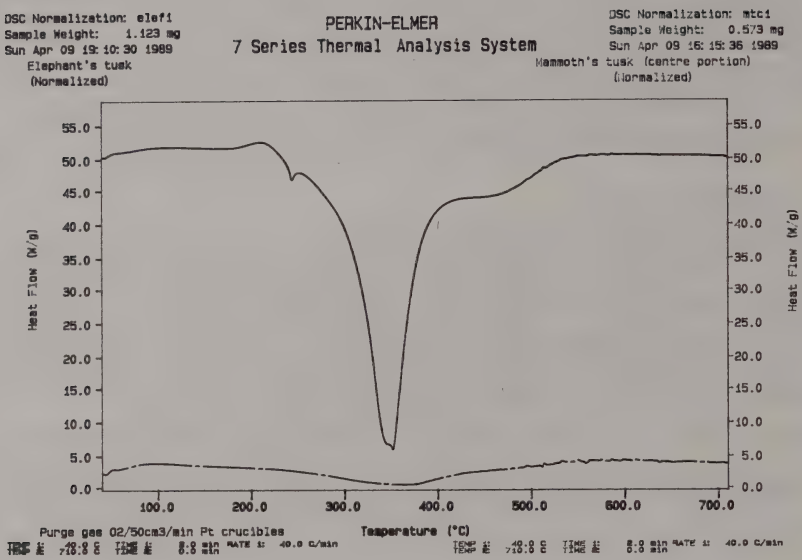


Fig. 5. Comparison between the spectra of fresh ivory and the core sample from the Roxton tusk.

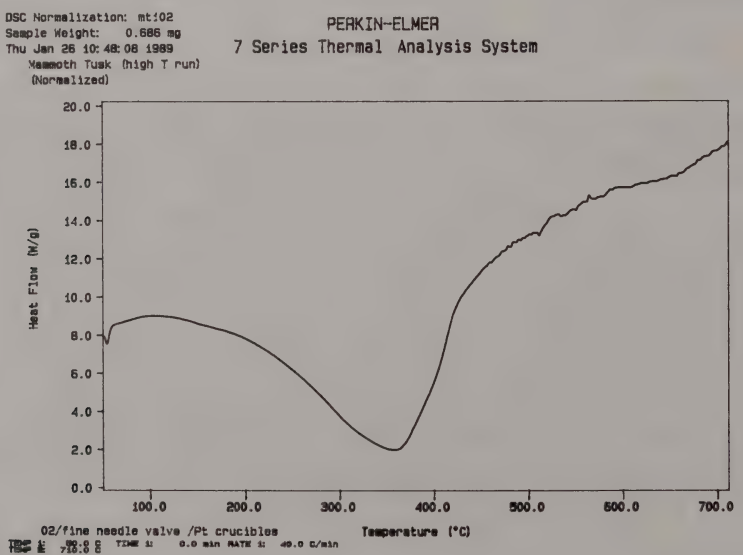


Fig. 6. Spectra of the bark sample of the Roxton tusk.

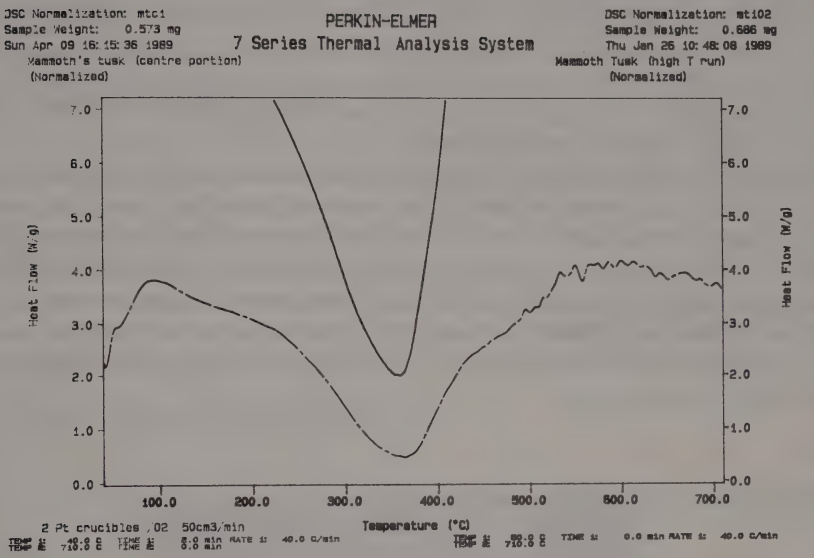


Fig. 7. Comparison between the spectra of the core and bark samples of the Roxton tusk.

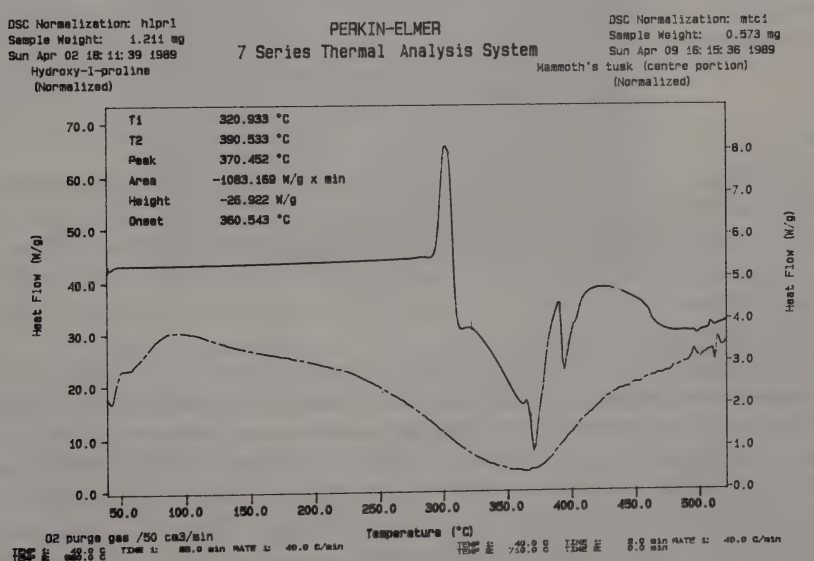


Fig. 8. Comparison between spectra of hydroxy-L-proline and the core Roxton tusk sample.

University College on two samples of the Roxton tusk (from the outer bark and the core) and a sample of fresh elephant ivory (less than 100 years old).

The instrumentation used was a Perkin Elmer DSC with a PE 7700 computer and TAS 7 software to analyze the data. The sample holders used were open platinum crucibles with oxygen as the purge gas at a flow rate of 50 cm^3/min. The heating rate was 40°C/min with starting temperatures at 40 or 50°C and the final temperature at 710°C. The reference 'sample' used was an empty platinum crucible.

The technique works by heating two crucibles at the same rate with independently controlled circuits so that no temperature difference exists between them. Change in energy is measured in Watts (J/sec) which is calculated as a unit of heat flow per weight of sample (W/g). Energy differences reflect changes in the sample resulting from oxidative degradation (if oxygen is the purge gas). As far as is known, the technique had not been applied to ivory previously. These experiments are preliminary attempts, the purpose of which is to ascertain if this technique has any value for the analysis of ivory, possibly as a technique for authentication of ancient objects made of ivory.

Results:

Numerical Data for the Major Exothermic Peak

	T_{onset} (°C)	T_{peak} (°C)	H_{peak} (W/g)	A_{peak} (W/g x min)
Elephant Ivory	305.4	351.6	45.7	5648.1
Roxton (bark)	243.9	363.5	8.9	1850.1
Roxton (core)	241.7	364.5	3.0	720.8
Hydroxy-proline	360.5	370.5	26.9	1083.

(where H = height and A = area)

Discussion

These preliminary results show a relationship between the oxidative degradation behaviour of fresh ivory and the Roxton tusk samples, illustrated especially by their similar peak temperatures. The exothermic reactions (peak is directed downwards) occured on different scales, exhibited by the different peak heights. These phenomenae correspond to some degree with the ages and extent of diagenesis of the samples. It is not clear why the peak heights for the two Roxton samples were different.

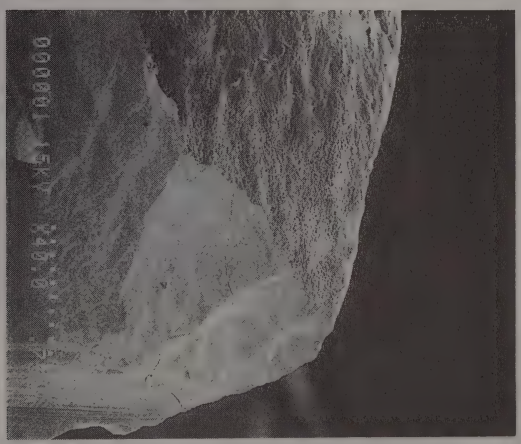
Hydroxy-proline is one of the main amino acids in collagen (it does not occur in other proteinacious materials) and its major exothermic peak temperature occurs in the same region as those of the ivory samples. This suggests that the energy effects observed reflect the oxidation of collagen. There appears to be a correlation between the amount of collagen (or its amino acids) and the size of the reaction. For archaeological materials, such differences may reflect the degree of the deterioration of the organic phase. However, it is puzzling that a larger oxidative reaction occured with the external tusk sample than with the core sample as one would expect that more collagen might be preserved in the core.

A great many more samples will have to be analysed and cross-referenced with other analytical techniques such as infra-red spectroscopy for the calorimetric technique to be truly conclusive. However, at present, it does seem to indicate a general trend (Odlyha, M., pers. comm.).

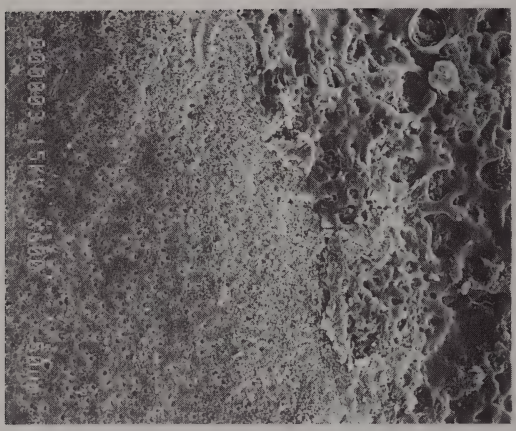
Scanning Electron Microscope Studies

Work on the scanning electron microscope was carried out in two phases. The first phase, which was concerned with the structural features which can be observed on fractured edges, was carried out with Dr. Simon Hillson at the Institute of Archaeology. Samples were selected from the core of the Roxton tusk and were fractured by striking with a hammer. Some edges were removed with a mini-circular saw for ease of mounting. The sample which is featured here was etched for thirty seconds in a dilute solution of ortho-phosphoric acid. Samples were mounted with nitrocellulose on aluminium stubs and gold coated with a sputter coater. The instrumentation used was a Hitachi S-570 Scanning Electron Microscope.

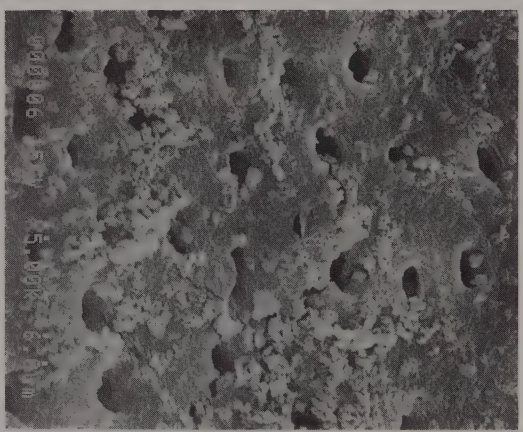
PLATES VIII–XII (SEM PHOTOGRAPHS)



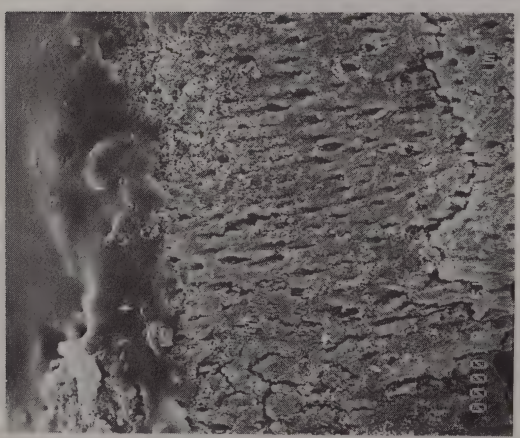
Pl. VIII. The fractured surface of the sample. At the top of the sample, there is a smooth film which might be a resin, an artifact of conservation treatment. The reticulated area near the edge of the fracture might also be a broken resinous film, although it is not clear. Such artifacts of treatment make scanning electron microscope work difficult, particularly when looking at unfamiliar substances such as mammoth ivory. The previous treament of the Roxton tusk was not documented, and thus, the identification of the film is challenging. It might possibly be the cured film of a polyvinyl acetate emulsion, a material which is thought to have been applied to the middle fragment of the tusk. Before these studies were carried out, it was thought that the largest fragment of the tusk from where the sample originates had not been treated.



Pl. IX. Detail of dentinal tubules. One can discern that the vertical columns of dentinal tubules are out of phase by one tubule, the micro-structure which is thought to account for the grid pattern in transverse sections of ivory.



Pl. X. Detail of tubules at high magnification. the ring which can be seen around some of the tubules is structured of *peritubular dentine*, which is a more dense and mineralized dentine.



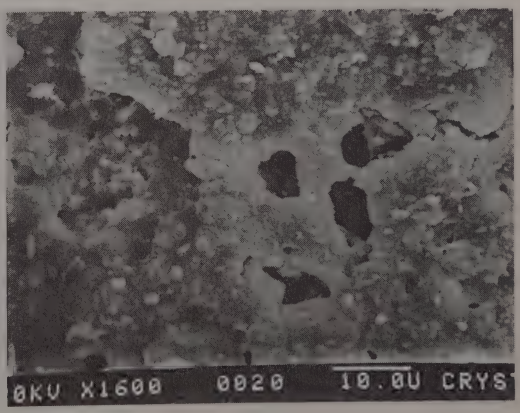
Pl. XI. Different section through the tubules. The material at the top of the photograph is of a different texture and colour than the tubules and is quite convincing as a resinous film.

Pl. XII. Growth lines in the ivory. The cracking appears to be both perpendicular to and in the planes of growth.

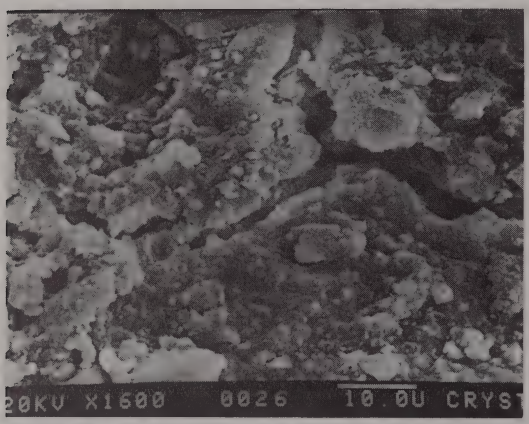
The second phase of investigation on the scanning electron microscope which was carried out with Juliet Munn at Birkbeck College, was concerned with features of surface alteration. Samples of different surface layers were selected from different parts of the largest tusk fragment, mounted with nitrocellulose on aluminium stubs and gold coated with a sputter coater. Energy dispersive x-ray fluorescence analysis was carried out on some of the samples and surface features, especially those in the black layer. The instrumentation used was a Jeol JSM-35CF scanning electron microscope with a Link EDAX detector and AN10000 analysing software.

The elements which were detected in the samples were zinc, sulphur, iodine, manganese, copper, iron, silicon, lead and sodium. Higher proportions of managnese, iron and sulphur were found in some surface structural features which were apparent in samples of the black layer from the proximal end of the tusk.

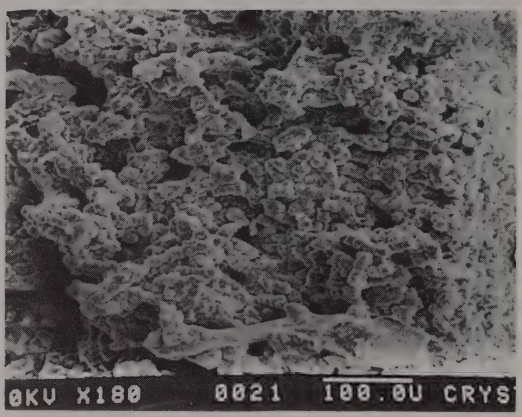
PLATES XIII–XX (SEM PHOTOGRAPHS)



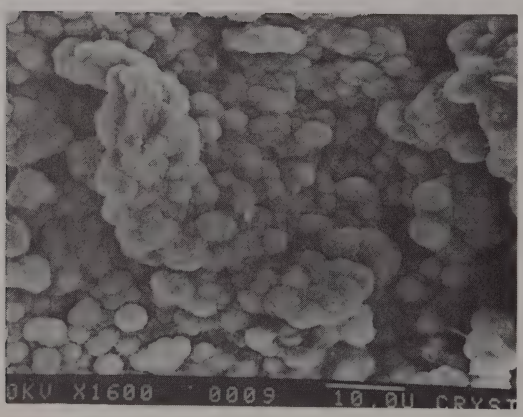
Pl. XIII. Sample from the outer, smooth bark layer near the centre of the fragment. Areas of dissolution, cracking and fissuring can be discerned.



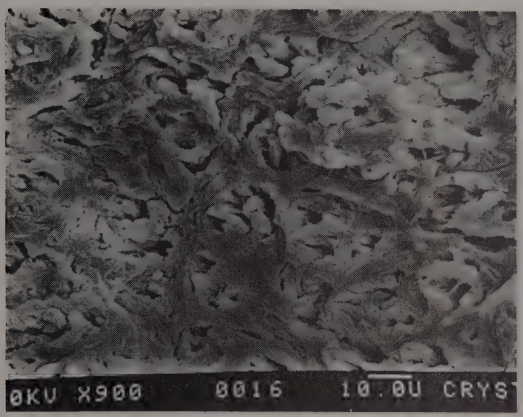
Pl. XIV. Sample from the ochre coloured layer at the proximal end of the fragment. Areas of cracking, dissolution and recrystallization can be seen.



Pl. XV. The undersurface of the same layer in Plate XIII. Recrystallization is evident. The form of these nodules is typical of the crystallization of calcium containing minerals in acidic, aqueous environments (Munn, J., pers. comm.).

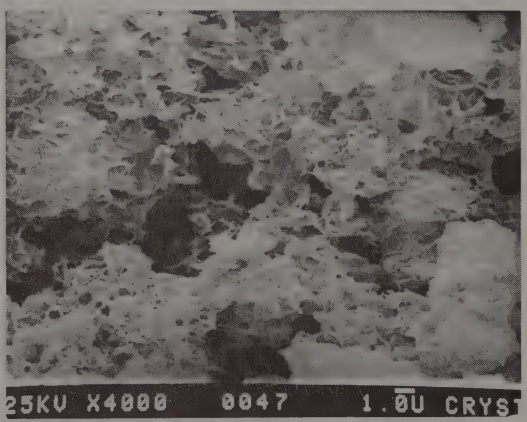


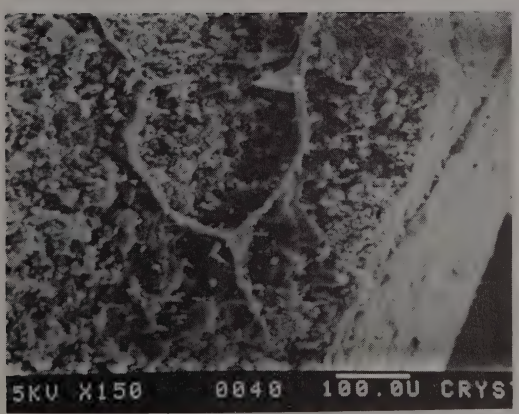
Pl. XVI. Sample from the undersurface of the smooth bark layer near the distal end of the fragment. The same type of recrystallized nodules are apparent here as on the undersurface of the sample in Plate XV. This type of alteration appears to be a feature which occurs under the external layers, perhaps because these areas can trap liquids.



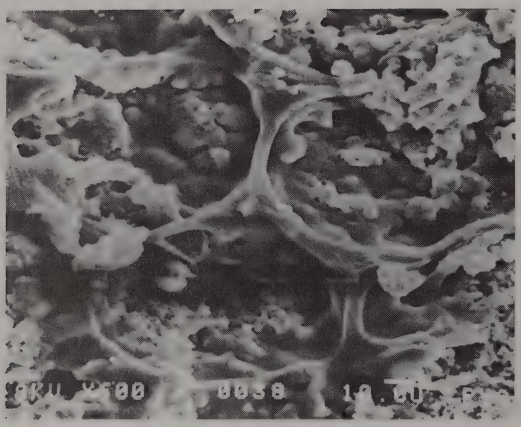
Pl. XVII. Sample from the white, outer layer near the centre of the fragment. The fibrous matted structure may represent altered dentinal tubules, or the impression of the collagen mats in the hydroxyapatite.

Pl. XVIII. Sample from the black layer on the proximal end of the tusk. The spongy-textured crystalline (?) phase represented here was high in manganese and iron by XRF analysis.





Pl. XIX. Sample from the black layer. Dendritic surface structure which reacted strongly to the electron beam, indicating that it may be organic or partially organic. It appears to be integral to the structure underneath. When analysed, it was found that its manganese and iron content were much higher than that of the average composition for the black layer, indicating that the metallic ions may be concentrated in structural features like this one.



Pl. XX. Sample from another area of the black layer on the proximal end of the tusk. The reticulate surface structure featured is similar to the one in Plate XIX. Spot analysis at the central 'convergence' yielded a result that was high in sulphur, calcium and copper. Inside the lower 'cell', the analytical results were high in manganese and iron and much lower in sulphur.

It is possible to briefly conclude from these studies that a great deal of environmentally influenced structural alteration has taken place in the Roxton tusk, particularly at the surface where the ivory micro-structure is completely transformed. These photographs serve merely as a small catalogue of some of the effects of diagenesis on mammoth ivory. The characterization of the specific alterations is difficult—generally, it is clear that dissolution and recrystallization have taken place which are related to the phenomenae of crack formation and fissuring, leading to ultra-structural deterioration.

The presence of metallic ions such as manganese and iron in some organic features in the black layer serves as supporting evidence for the theory that these coloured layers are caused by mould colonies which absorb and deposit the ions on the surface of the ivory. However, these structures must be identified for a fuller understanding of the phenomenon. The independent studies by British Petroleum on Roxton tusk samples do seem to support this causal hypothesis, however.

It is also clear from these studies that it is important to have a source of palaeolithic ivory for study which is not contaminated by impregnating or coating resins. The aged ivory terrain is not familiar enough to discount that resin coatings may be misleading when viewed at high magnification. The reticulated surface which is apparent in plates VIII and IX is an example of evidence which is difficult to interpret because of the presence of apparently resinous film.

CONSERVATION

Considerations for Conservation

The conservation of mammoth tusk specimens is neither philosophically nor practically simple. Tusks are not artifacts and fall under a different rubric than worked ivory objects. Their role in the museum collection should, in general, be considered as similar to that of fossils or geological specimens. While tusks are sculpturally satisfying and stimulate the imagination, the reasons for their presence in museums are to promote knowledge about mammoths and the evolution of species, the prehistoric environment, and the relationship

between the ancestors of modern humans and local fauna including the exploitation of ivory as a material for building and making objects, (Sutcliffe, 1986).

Because of the increasing sophistication of analytical techniques in recent years (and one would expect in the future) the concept of 'mammoth-tusk-as-object' is anachronistic. Analysis can be fruitfully used to find out valuable information about prehistoric diet and adaptation over time, biological structures such as dentine, collagen and genetic coding, and long term effects of burial environments on materials.

These analytical potentials are not put forward to encourage the destructive sampling of mammoth tusks. On the contrary, the size of sample needed for most techniques which might be of use is very small. However, what is called for is a reassessment of conservation ethics as they are applied, not only to mammoth tusks, but to all sub-fossil materials. Because most conservation treatments which have been applied to tusks preclude many analytical techniques such as the scanning electron microscope, micro-combustion, thermal analysis, elemental analysis and the study of radio isotopes such as carbon, nitrogen and strontium, they should only be applied with discretion. Instead of conserving gross form at the expense of a pristine micro-structure (i.e. through impregnation with a resin) conservators must regard as primary the preservation of internal structures and chemistry, perhaps at the expense of gross form.

Obviously, any compromise is problematic, but there is no active conservation technique available which can halt the deterioration of the macro-morphology of tusks without altering other properties such as the microstructure. In addition, all of the conservation techniques which have been used in the past (surface coating and impregnation with natural and synthetic polymers) for gross structural preservation have disadvantages in terms of their abilities to deter degradation.

Pl. XXI. Segment of Siberian mammoth tusk showing separations between growth cones. (Odontological Museum).

Conservation practices in general have tended to move away from traditional techniques because of the awareness that foreign materials, which may be introduced into/onto artifacts and specimens, themselves degrade and complicate the course of future preservation. It has become increasingly clear that the best technique for the care of tusks, and many other types of artifacts and objects, is passive conservation. For tusks, this indicates the maintenance of full physical support and a stable environment with temperature between 15–20°C and relative humidity between 50 and 55%. Relative humidities lower than 50% cause cracking (La Fontaine and Wood, 1982) and higher create stresses and invite microbial attack.

Instead of consolidating freshly excavated tusks (unless there is no remaining structure or strength whatever) on site or in the laboratory, they should be given full support with bandages, earth, foam and the like, and allowed to dry extremely slowly. It might even be worthwhile to freeze-dry tusk fragments if it could be done quickly so that large ice crystals could not form (Parish, D., pers. comm.). Mammoth tusks, like many specimens and artifacts of archaeological interest, are finite in quantity. A stable, 'as-excavated' condition of any new or untreated specimens must be responsibly guarded.

There is considerable room for necessary discussion, with regard to the application of this revised conservation ethic for tusks and sub-fossil bone. In many cases, the condition of a tusk or tusk fragment will itself dictate whether passive conservation may be successfully employed. For example, a tusk fragment which has been consolidated or surface coated in the past will forever contain artifacts of the treatment and is not necessarily a worthwhile candidate for the care which exclusively passive conservation demands. Such treated fragments (for example the middle fragments of the Roxton tusk which is highly deteriorated) may be ethically treated with familiar conservation procedures (although very few consolidants are completely reversible in ivory). In addition, a decision may be made for a museum collection that some tusks are designated for display and others for research. Display specimens should be aesthetically pleasing, clean and as complete as possible and should be treated accordingly.

Materials Which Have Been Applied to Mammoth Tusks in the Past

Local mammoth tusk specimens from the late 19th century which were examined recently in the Bedford Museum appear to have been treated with a variety of methods. Three examples were bound with cords. This method in itself, while retaining fragments together in a general conformation, failed to provide adequate support. Lack of physical support compounded with fluctuating environmental conditions over the years has contributed to the extremely degraded condition of these specimens.

One of the bound specimens, now about nine inches in diameter and a foot in length, was originally nine feet long. It contained evidence of a brown adhesive, probably animal glue, which also contributed to the degradation because of its brittleness and inflexibility. The animal glue did not expand and contract with the porous ivory and introduced stresses into the specimen. Another bound specimen, with a dark, tree bark-like surface, appeared to have been treated by impregnation with a molten wax. The voids inside were supported with clumps of dark woolly fibre. This specimen was also quite fragmentary.

The most successfully treated tusk in this collection of early excavated examples in terms of gross morphology was coated with a greenish/brown substance, likely shellac. Its ends

were stopped up with a plaster or museum cement (often mixtures of plaster of Paris, sugar and gum arabic [Howie, 1986]), presumably to seal it in some fashion from the effects of moisture. This tusk, while having a peculiar appearance in terms of colour, had only one longitudinal crack and some blistering at the surface on the inner curved side. The blistering is presumably due to the different co-efficients of expansion between the ivory and the consolidating skin on the surface. Blistering may also result from the action of soluble salts.

Another tusk fragment, from Siberia which was examined at the Odontological Museum, Royal College of Surgeons (A240.2) also contained plaster in the interstices which had opened between the cones in the transverse section. This plaster had the typical powdery appearance of a plaster which was 'starved' of water before setting and serves as a kind of warning against using water containing systems to support ivory. Such materials as plaster of Paris may be damaging in their application and ultimately do not provide the intended support.

Since the introduction of synthetic resins in the 1930's and 1940's which can be used as a consolidant in the form of a dilute solution in organic solvent or as an emulsion, these have been the most commonly used materials to treat tusks. The detailed history of the use of resins on tusks is well documented in the published literature, especially Howie (1984).

The most widely applied resin has been polyvinyl acetate (PVA) as a dilute emulsion. This material is still advocated by many conservators because it is not unpleasant to work with, has fairly good ageing properties and can be applied to freshly excavated ivory while it is still wet. It can be applied by brushing and dipping, having the advantage that it can be used repeatedly without disrupting resin which has previously cured. It can also be applied by long term immersion or by complicated gravity feeding apparatus which flush the specimen through its length with emulsion until it is completely impregnated (Doyle, 1987). The disadvantages of the material is that it has a low glass transition temperature, tending to become tacky and 'cold-flow' in warm weather. PVA is also rather acidic (approximately pH 3.5) and may chemically alter ivory, especially if it contains carbonate substitutions. PVA does not penetrate well into ivory, so that if complete impregnation is desired, it is difficult to achieve. Some of these disadvantages have been overcome recently by the use of acrylics in the form of colloidal dispersions in water which have been found to provide good impregnation in freshly excavated bone specimens.

Another material which has been used on tusks since the 1960's is soluble nylon. In theory, it can provide consolidating strength without inhibiting the process of the removal of soluble salts by washing. Soluble nylon has fallen out of favour for the treatment of museum objects because it rapidly cross-links and becomes insoluble. However, it is still being used by at least one conservator in Britain to prevent surface flaking of tusks with apparently successful results (Parish, D., pers. comm.).

The resin which is probably most suitable for the consolidation of mammoth ivory (if the procedure is warranted) is the widely applied ethyl methyl methacrylate copolymer, Paraloid B-72. It is inert, stable, neutral, water white and has good ageing properties. Its application is no more complicated than that of any other resin and it is strongly advocated for consolidating ivory artifacts by Snow and Weisser (1984) when they published the collective treament of five hundred ivory objects.

The resin is commonly used in a 5–7% solution in toluene or acetone. Research has shown that the application of organic solvents to ivory is not a benign procedure and that they can alter structure, especially surface structures (Matienzo and Snow, 1986). Of the three: toluene, acetone and ethanol, toluene caused qualitative changes detectable by infrared spectroscopy. Clearly, some care must be taken in the selection of solvent used. Although toluene is generally preferred because of its comparatively low surface tension and vapour pressure, acetone or an acetone:ethanol mixture may be safer. Up to 40% ethanol can be incorporated into Paraloid B-72 solution in acetone for the purpose of slowing evaporation. Paraloid B-72, which is probably the safest of available resins, has been found to contribute to brittleness and surface cracking on tusks (Morrison, L., pers. comm.). This effect may be due to pressure and stresses which develop as a result of solvent evaporation. As a preventive measure, consolidated tusks during treament, like freshly excavated ivory must be allowed to 'dry out' very slowly.

The canon of consolidation in conservation is extremely strong. In various forms, it is one of the earliest and most enduring of conservation treatments. It has also inspired tremendous amounts of research into the potential of new materials for conservaion and their effects on structure. One of the earliest consolidation gospels is *New Methods for the Consolidation of Fragile Objects* (Rosenqvist, 1961) which is important as a period piece because it coincides with the advent of a scientifically rigorous approach to conservation. Indeed, for the preservation of many types of artifacts, consolidation is the only important alternative. However, in accordance with a new ethic for the conservation of mammoth tusks, approaches for environmental regulation and mechanical support become dominant.

Conservation of the Roxton Tusk and the Selection of Materials

One of the first priorities in considering a system of mechanical support is the design of packing for storage. The important concerns in the selection of packing materials are to find those which are permeable to air (so that pockets of condensation do not develop), strong (because most tusks are heavy and awkward in shape), and provide as much contact with the surface of the tusk as possible. It is a remarkable fact that a piece of aged and brittle paper can be crumpled and bent without damage if it is encased between two sheets of Melinex (methyl methacrylate sheet). One can extrapolate from this principle for the support of tusks. Stresses can be homogenized and dissipated if as much surface area as possible is supported.

One possible design which was considered to support the Roxton tusk is as follows: the major support might be provided by a block of expanded polystyrene foam which is carved to fit the shape of the tusk. This block would rest on a stainless steel tray (for strength) which is perforated with rows of drilled holes to allow for air circulation. The whole assemblage might be housed in a wood box with a Perspex (methyl methacrylate sheet) top or storage cabinet which is sealed so that an internal microclimate can be maintained with conditioned silica gel, or in a room with an appropriately controlled environment.

Conservation treatments which are acceptable under the revised ethic for tusks are those which provide non-intrusive mechanical support. Methods which have been tested recently for the mechanical support and gap-filling of wood objects are very promising for tusks. Wood, like ivory, is very responsive to environmental changes and has some of the same patterns of deterioration as a result of fluctuating conditions i.e. longitudinal and radial

cracking. The material which has been found to be most suitable for filling and supporting wood objects is a mixture of silicone rubber and glass micro-balloons.

Silicone rubbers have a low modulus of compression, are elastic and have good adhesive properties, but can be removed mechanically quite easily. When mixed with micro-balloons in the proportion 3:2:5, silicone rubber is formed into a workable, easily applied paste whch can be subsequently carved, sanded and painted, if necessary, after curing (Barclay and Grattan, 1987). Because the material can be compressed easily but retains its elasticity, it responds with its substrate according to environmental conditions. It 'moves' with the ivory providing constant mechanical support without introducing new stresses into the substrate.

The silicone rubber which is most appropriate for application to tusks is the Dow Corning 738 RTV, which is convenient to use as it is catalysed by atmospheric moisture, and cures by the cross-linking of alkoxy groups. The alternative 734 RTV is probably not safe for tusks, because although inert when cured, it releases acetic acid as a by-product of its curing reaction.

One of the disadvantages in using silicone rubber as a gap-filler in a porous substrate is that silicone 'oils' or the uncured portion of the material can be absorbed by the substrate. In addition to causing discolouration, the intrusion of silicone oil into the tusk completely defeats the philosophy of using non-intervening conservation methods. To eliminate this problem, it is necessary to apply a barrier film before applying the silicone rubber/micro-balloon mixture. The film-forming material which is recommended in the literature for wood is the cellulose ether ethyl hydroxy ethyl cellulose in a 2% solution in water. This cellulose ether is also miscible in a range of organic solvents including aliphatic hydrocarbons such as IMS which is preferable for the treatment of ivory. Another cellulose ether, ethyl cellulose (EC), may be used as a barrier film as well. The chemistry of cellulose ethers is discussed fully in the literature (Horie, 1987; Hatchfield, 1988).

Both ethyl hydroxy ethyl cellulose (EHEC, Hercules Corporation) and ethyl cellulose (Hercules Corporation) are soluble in a wide range of organic solvents. Their properties as films appear to be quite similar although industrially, ethylcellulose is commonly applied in foods, food packaging and as a binder, filler, coating for vitamin tablets, while EHEC is used in printing inks, lacquers and varnishes (Hercules, 452–4; Hercules, 475–2). Each are available in a range of molecular grades.

The film properties which were studied in order to evaluate their performance as a barrier were viscosity and ease of application, tackiness and adhesion, flexibility, optical properties, tenacity and reversibility. Other properties which are important to consider are ageing characteristics and interaction with the silicone rubber mixture. The first group of properties were evaluated in a general and practical way by making up solutions of the cellulose ethers in IMS in a variety of concentrations (0.2, 0.5, 0.7, 1.0, and 2.0 percent w/v) and painting out 2 x 2 inch squares by brush onto Melinex sheeting (methyl methacrylate). At first, the grades EHEC-low (20–35 cps) and EC-N10 (8–11 cps) were tested.

The lower concentrations were found to be unacceptable because of the fragility of the cured films. Both cellulose ethers formed white, opaque films at the acceptable higher concentrations which were considered undesirable because such films would be difficult to distinguish from the ivory substrate. The pH of the EHEC solutions were 4.5 and those of EC, 5, both of which are slightly acidic.

The second set of cellulose ethers tested were of higher molecular grades and within the recommended range (Hatchfield, 1988). These were EHEC-high (125–250 cps) and EC N-200 (150–250 cps). The films were painted out as before, representing the same range of concentrations. These grades produced transparent, flexible and tenacious films. All were easily applied and adhered well to the Melinex. A decision was made to use the EHEC-high in the treatment because it has been reported that EC did not perform well in accelerated ageing tests (Horie, 1987), and because EHEC did not appear to have any problems of non-compatability with silicone rubber (Barclay and Grattan, 1987). EHEC also performed very well as a surface consolidant on small areas of flaking on the smallest fragment of tusk.

Another material which was found to be useful for supporting cracked areas which were too small for the more viscous silicone rubber mixture was a suspension of glass micro-balloons in a 10% solution of Paraloid B-72 (Hatchfield, 1986). This material is different from the silicone rubber mixture in that it does not move with the material but, care can be taken in its application to keep the 'concentration' of micro-balloons fairly low. In this way, it is quite 'porous' and can be crushed if force is applied so that its strength does not stress the ivory. It is useful for holding together very degraded areas, but should not be used as a general support because there is no practical barrier film which can prevent the acrylic resin from permeating the ivory substrate. However, this gap filler is very recognizable under the microscope, and such occurances would be taken into account in the future.

Treating the Tusk

The smallest fragment of the tusk was treated first so that the new materials could be tested on a controlled level. Smaller disassociated cubes and fragments were compared to see if they could be joined. Joins were made with an adhesive made from Paraloid B-72 in acetone and ethanol. Flaking surface areas were lightly consolidated with a 2% EHEC solution in IMS using a small brush. Highly deteriorated parts were consolidated by injecting the 10% Paraloid B-72 solution in acetone/ethanol into cracks with a hypodermic needle and syringe. Small longitudinal gaps were filled to help hold pieces together with the mixture of Paraloid B-72 in acetone/ethanol and glass micro-balloons. It was impossible to re-attach the smallest fragment to the largest fragment because of structural collapse at the distal end of the tusk.

The middle fragment has an undocumented history of treatment. A brief note to the Bedford Museum by the student who was responsible for its care stated that treatment had started on the tusk and that it had been bandaged and was ready to be consolidated (Brind, R., pers. comm.). The evidence for consolidation of the middle fragment is strong, however, most of the resin appears to be on the surface. Very little penetration occured, if any. When small sample sections were sawn for polishing and examination, they were extremely friable and did not contain evidence of any resin when they were examined with the various microscopy techniques. Because this fragment is in such poor condition and has been consolidated previously, it seems ethical to try to stabilize this piece more fully.

Its previous conservation treatment was not particularly successful in terms of realigning detached areas. The fragment will be bandaged for support with gauze bandages. The surface coating will be removed by brief soaking in baths of IMS. Disarticulated areas will be

realigned, and it will be rebandaged and consolidated by immersion for 7 days or longer if necessary in a 5% solution of Paraloid B-72 in an acetone/ethanol mixture. It will be allowed to evaporate very slowly in an acetone vapour environment.

Because the primary conservation requirement of the largest fragment was full support, a temporary support was made from a mixture of polystyrene beads and silicone rubber. A thick 'solution' was packed between two polyethylene sheets which were heat sealed together to make an enclosed cushion. The tusk was separated from the support by acid-free tissue and the viscous and tacky mixture in the cushion was moulded around it so that every area was supported. This technique has proved very successful in detering structural deterioration of the tusk, but has the disadvantage of not being porous—pockets of condensation could develop between it and the tusk. Another disadvantage is that this type of support is probably not attractive enough for display purposes, although with some engineering, that factor might be overcome.

The largest fragment will be given minimal treatment if at all. The broken edges of the distal end will be given some support. The storage support, however, is its main conservation treatment. The whole of the tusk will be displayed at the Bedford Museum when its treatment is complete. The purpose of the exhibit will be to display the tusk as part of the local environment, emphasizing the need for conservation of palaeolithic materials. Photographs documenting its treatment and analysis will acompany the display.

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BOOKS RECEIVED

1988–1989

The following books have been received but have not been reviewed in this issue. The fact that they are listed here does not preclude their review in a later issue. For book reviews see pages 231–308.

BARNES, Gina L. *Protohistoric Yamato: archaeology of the first Japanese state*. Ann Arbor: University of Michigan Center for Japanese Studies; The Museum of Anthropology, University of Michigan, 1988. xx, 473 pp; 94 figs. (Michigan papers in Japanese studies, no. 17; Anthropological papers, Museum of Anthropology, University of Michigan, no. 78.) $15.00

BARRETT, John C., FITZPATRICK, Andrew P. and MACINNES, Lesley (eds) *Barbarians and Romans in North-West Europe: from the later Republic to late antiquity*. Oxford: British Archaeological Reports, 1989. 241 pp; figs, tbls. (BAR International series, 471) £15.00

BERRENBERG, Rüdiger Schneider *Sie Bauten ein Abbild der Seele: Anmerkungen zur Metrik und Harmonik der St. Elisabethkirche in Marburg und des Parthenon-Tempels in Athen*. München: Verlag Rüdiger Schneider Berrenberg, 1988. xii, 149 pp; 34 figs. [Price not stated]

BIRKS, Hilary H. [et al.] (eds) *The cultural landscape: past, present and future*. Cambridge: Cambridge University Press, 1988. xviii, 521 pp; illus. £37.50

BLACK, Rhona M. *The elements of palaeontology*. 2nd ed. Cambridge: Cambridge University Press, 1988. xi, 404 pp; 236 figs. Hbk: £27.50; pbk: £12.95

BOGUCKI, Peter *Forest farmers and stockherders: early agriculture and its consequence in North-Central Europe*. Cambridge: Cambridge University Press, 1988. xiv, 247 pp; 60 figs, 3 tbls. (New Studies in archaeology) £27.50

BONSALL, Clive *The Mesolithic in Europe: papers presented at the Third International Symposium, Edinburgh 1985*. Edinburgh: John Donald, 1989. xii, 645 pp; illus. At head of title: U.I.S.P.P. Mesolithic Commission. £35.00

BRAWER, Mose (ed.) *Atlas of the Middle East*; prepared by Carta, Jerusalem. New York: Macmillan; London: Collier Macmillan, 1989. 140 pp; illus. £54.00

BROWN R. Allen *Castles from the air*, with photographs from the University of Cambridge Collection. Cambridge: Cambridge University Press, 1989. [8], 246 pp; illus. (Cambridge Air Surveys) £17.50

BUCHANAN, W.F. *Shellfish in prehistoric diet: Elands Bay, S.W. Cape Coast, South Africa*. Oxford: British Archaeological Reports, 1988. [4], 257 pp; 11 figs; 75 tbls. (BAR International series, 455) £16.00

CLUTTON-BROCK, Juliet (ed.) *The walking larder: patterns of domestication, pastoralism and predation: [papers from the World Archaeological Congress held in Southampton, in 1986].* London: Unwin Hyman, 1989. xxii, 368 pp; illus. (One world archaeology, 2) £40.00

COMMISSION DE NOMENCLATURE SUR L'INDUSTRIE DE L'OS PRÉHISTORIQUE. *Fiches typologiques de l'industrie osseuse préhistorique. Cahier I: Sagaies*, [par] H. Delporte [et al]. *Cahier II: Propulseurs*, [par] Pierre Cattelain. Aix-en-Provence: Publications de l'Université de Provence et publié avec le concours et sur la recommendation du Conseil International de la Philosophie et des Sciences Humaines (UNESCO), 1988. 70 leaves in folder; 37 leaves in folder; illus. At head of title: Union International des Sciences Préhistoriques et Protohistoriques. Cover title. Cahier I: FF 240; cahier II: FF 120

CONNAH, Graham *"Of the hut I builded": the archaeology of Australia's history.* Cambridge: Cambridge University Press, 1988. xvi, 176 pp; illus. £19.50

CURTIS, John. *Excavations at Qasrij Cliff and Khirbet Qasrij*; with contributions by Dominique Collon and appendices by R.K. Uprichard, M.S. Tite, I.C. Freestone and M.J. Hughes. London, British Museum Publications, 1989. 75 pp; 49 pp of figs; 13 pp of plates. (British Museum Western Asiatic Excavations, 1; Saddam Dam report, 10)

DAVIES, Roy W. *Service in the Roman Army*; edited by David Breeze and Valerie A. Mazfield. Edinburgh: Edinburgh University Press with the Publications Board of the University of Durham, 1989. xii, 336 pp; illus. £30.00

DANDAMAEV, Muhammad A. and LUKONIN, Vladimir G. *The cultural and social institutions of ancient Iran*; English edition by Philip L. Kohl with the assistance of D.J. Dadson. Cambridge: Cambridge University Press, 1989. xvi, 463 pp; 45 illus; 3 maps. £50.00

DANIEL, Glyn and RENFREW, Colin *The idea of prehistory.* 2nd ed. Edinburgh University press, 1988. 221 pp; illus. Pbk: £7.50

DAVISON, David P. *The barracks of the Roman Army from the 1st to 3rd centuries AD: a comparative study of the barracks from fortress, forts and fortlets with an analysis of building types and construction, stabling and garrisons.* Oxford: British Archaeological reports, 1989. 3 vols. (xiv, 1–255; vi, 257–562; ii, 563–914 pp); illus. (BAR International series, 472) £52.00

DORRELL, Peter *Photography in archaeology and conservation.* Cambridge: Cambridge University Press, 1989. x, 262 pp; 99 pls. (Cambridge manuals in archaeology) £27.50

EHRENBERG, Margaret *Women in prehistory.* London: British Museum Publications, 1989. 192 pp; illus. £9.95

FRERE, S.S. and WILKES J.J. *Strageath: excavations within the Roman fort, 1973-86.* London: Society for the Promotion of Roman Studies, 1989. 276 pp; 40 pp of pls; 136 figs; 7 tbls. (Britannia monograph series, no. 9) £22.00

FULFORD, Michael *The Silchester amphitheatre: excavations of 1979-85.* London: published by

the Society for the Promotion of Roman Studies, 1989. xxii, 197 pp; 80 figs; 40 pp of plates; 4 plans in pocket. (Britannia monographs series, no. 10) £18.00

GARCIA-GELABERT PÉREZ, Maria Paz and BLAQUEZ MARTINEZ, José María *Castulo Jaén, España. 1: Excavaciones en la necróplois ibéricaa del Estacar de Robarinas (s.IV a.C.)*. Oxford: British Archaeological Reports, 1988. xiii, 425 pp; illus. (BAR International series, 425) £26.00

GROVE David C. (ed.) *Ancient Chalcatzingo*. Austin: University of Texas Press, 1987. viii, 571 pp; [Texas Pan American series] $75.00

HERTZFELD, Ernest E. *Iran in the Ancient East: archaeological studies presented in the Lowell lectures at Boston*. New York: Hacker Art Books, 1988. xii, 363 pp; 421 figs; 131 pp of pls. First published New York: Oxford University Press, 1941. $120.00

HIGHAM, Charles *The archaeology of mainland southeast Asia*. Cambridge: Cambridge University Press, 1989. xvi, 387 pp; illus; tbls; maps. (Cambridge world archaeology) Hbk: £30.00; pbk: £12.50

HODDER, Ian (ed.) *The meanings of things: material culture and symbolic expression: [papers from the World Archaeological Congress held in Southampton, 1986]*. London: Unwin Hyman, 1989. xxvii, 265 pp; illus. (One world archaeology, 6) £30.00

HODGES, Richard *The Anglo-Saxon achievement: archaeology and the beginnings of English society*. London: Duckworth, 1989. xi, 212 pp; 56 illus. £24.00

HODGES, Richard *Dark Age economics: the origins of towns and trade, AD 600–1000*. 2nd edition. London: Duckworth, 1989. x, 230 pp; 45 figs; 6 tbls. (New directions in archaeology) Paperduck £9.95

HOUSTON, S.D. *Maya glyphs*. London: British Museum publications, 1989. 64 pp; illus. (Reading the past, 7) £4.95

INTERNATIONAL CONFERENCE ON THE BEGINNING OF THE USE OF METALS AND ALLOYS, 2nd Zhengzhou, China, 21–26 October 1986. The beginning of the use of metals and alloys; edited by Robert Maddin. Cambridge, Mass; London: The MIT Press, 1989. xiv, 393 pp; illus. £49.50. $74.25

JACKSON, Ralph *Doctors and diseases in the Roman Empire*. London: British Museum Publications, 1988. 207 pp; 50 illus. £17.50

JOHNSON Arthur W. *The practical guide to book repair and conservation*, London: Thames and Hudson, 1988. 111 pp; 100 figs. £12.95

KEMP, Barry J. *Ancient Egypt: anatomy of a civilisation*. London: Routledge, 1989. 356 pp; 11pls; 103 figs; £35.00

KENT, Susan (ed.) *Farmers as hunters: the implication of sedentism*. Cambridge: Cambridge University Press, 1989. ix, 152 pp; illus. (New directions in archaeology) £27.50

LAYTON, Robert (ed.) *Conflict in the archaeology of living traditions: [papers from the World Archaeological Congress held in Southampton, in 1986].* London: Unwin Hyman, 1989. xxiii, 243 pp; illus. (One world archaeology, 8) £28.00

LAYTON, Robert (ed.) *Who needs the past?: indigenous values and archaeology: [papers from the World Archaeological Congress held in Southampton, in 1986].* London:Unwin Hyman, 1989. xx, 215 pp. (One world archaeology, 5) £28.00

McPHERRON, Alan and SREJOVIC, Dragoslav (eds) *Divostin and the neolithic of central Serbia.* Pittsburgh, Department of Anthropology, University of Pittsburgh, 1988. xiv, 492 pp; figs; pls; 11 plans on 27 sheets all in slipcase. (Ethnology monographs, 10) $56.00

MALLORY, J.P. *In search of the Indo-Europeans: language, archaeology and myth.* London: Thames and Hudson, 1989. £24.00

MILLER, Daniel, ROWLANDS, Michael and TILLEY, Christopher (eds) *Domination and resistance: [papers from the World Archaeological Congress held in Southampton, in 1986].* London: Unwin Hyman, 1989. xx, 332 pp; illus. (One world archaeology, 3) £35.00

MORPHY, Howard (ed.) *Animals into art: [papers from the World Archaeological Congress held in Southampton, in 1986].* London:Unwin Hyman, 1989. xxiv, 465 pp; pls (25 col). (One world archaeology, 7) £50.00

MUNRO-HAY, S.C. *Excavations at Askum: an account of research at the ancient Ethiopian capital directed in 1972–74 by the late Dr Neville Chittick*; with contributions by A. Kaczmarczyk [et al]; volume editor: D.W. Phillipson. London: The British Institute in Eastern Africa; distributed by Thames and Hudson, 1989. xvi, 359 pp; pls; figs; tbls. £30.00

NEEDLES, Howard L. and ZERONIAN, S. Haig (eds) *Historic textile and paper materials: conservation and characterisation*; developed from a symposium sponsored by the Cellulose, Paper and Textile Division at the 188th Meeting of the American Chemical Society, Philadelphia, Pennsylvania, August 27–29, 1984. Washington D.C.: American Chemical Society, 1986. (Advances in chemistry series, 212.) $94.95 (North America); $113.95 (Export price)

NUNN, Astrid *Die Wandmalerei und der glasierte Wandschmuck im alten Orient.* Leyden: Brill, 1988. xxviii, 257 pp; plus 104 pp of plates (some col.); map. (Handbuch der Oreintalistik: Siebente Abteilung, Kunst und Archäologie; 1. Bd., 2. Abscnitt, B, Lfg. 6) HF1 285.00. (To subscribers to the Abteilung: HF1 250.00)

O'CONNOR, T.P. *Bones from the General Accident Site, Tanner Row.* London: The Council for British Archaeology, 1988. 61–136 pp; figs; 4 pp of pls; microfiche in pkt. (The archaeology of York, vol. 15, fasc. 2) £10.00

OLIVER, Adrian *Safety in archaeological fieldwork*; prepared for the Countryside Committee of the Council for British Archaeology with illustrations by Bill Tidy. London: Council for British Archaeology, 1989. 36 pp; illus. (CBA practical handbooks in archaeology, no. 6) £2.50

OWEN, Linda R. *Blade and microblade technology: selected assemblages from the North American Arctic and the Upper Palaeolithic of Southwest Germany*. Oxford: British Archaeological Reports, 1988. vii, 394 pp; 52 figs; 19 tbls. (BAR International series, 441) £25.00

PRICE, T. Douglas (ed.) *The chemistry of prehistoric human bone*. Cambridge: Cambridge University Press, 1989. xxiv, 291 pp; illus; tbls. (School of American Research advanced seminar series) £35.00

PURDY, Barbara A. (ed.) *Wet site archaeology: [proceedings of International Conference on Wet Site Archaeology, Gainesville, Fl., December 12–14 1986, sponsored by National Endowment for the Humanities and University of Florida]*; editorial assistant: Elise V. Le Compte. Calwell (New Jersey): The Telford Press, 1988. xiii, 338 pp; illus. Hbk: $50.00; pbk: $32.50

RAVESLOOT, John C. *Mortuary practices and social differentiation at Casas Grandes, Chihuahua, Mexico*. Tucson: University of Arizona Press, 1988. (Anthropological papers of the University of Arizona, no. 49.) $25.00

SABLOFF, Jeremy A. *The cities of ancient Mexico: reconstructing a lost world*. London: Thames and Hudson, 1989. 224 pp; 150 pls. £12.95

SERJEANTSON, D. and WALDRON, T. (eds) *Diet and crafts in towns: the evidence of animal remains from the Roman to the Post-Medieval periods*. Oxford: British Archaeological Reports, 1989. [6]. 223 pp; figs; tbls. (BAR British series, 199) £15.00

SHENNAN, Stephen J. (ed.) *Archaeological approaches to cultural identity: [papers from the World Archaeological Congress held in Southampton, in 1986]*. London: Unwin Hyman, 1989. xxv, 317 pp; illus. (One world archaeology, 10) £35.00

SHENNAN, Stephen *Quantifiying archaeology*. Edinburgh: Edinburgh University Press, 1988. 364 pp; figs; tbls. Pbk £8.95

SMITH, R.R.R. *Hellenistic royal portraits*. Oxford: Clarendon Press, 1988. xviii, 196 pp; 80 pp of pls. (Oxford monographs on classical archaeology) £60.00

TORRENCE, Robin (ed.) *Time, energy and stone tools*. Cambridge: Cambridge University Press, 1989. viii, 124 pp; figs. (New directions in archaeology)

UNGER-HAMILTON, Romana *Method in microwear analysis: prehistoric sickles and other stone tools from Arjoune, Syria*. Oxford: British Archaeological reports, 1988. 331 pp; 10 tbls; 29 pls; 45 figs. (BAR International series, 435) £20.00

VELARDE, Giles *Designing exhibitions*. London: The Design Council, 1988. 188 pp; illus (some col.) £14.95

WILHELM, Gernot *The Hurrians*. Warminster: Aris & Phillips, 1989. vii, 132 pp; 31 figs; map. (Ancient Near East series) Hbk: £16.00; pbk: £8.75

WILLEY, Gordon Randolph *Portraits in American archaeology: remembrances of some distinguished Americanists*. Albuquerque: University of New Mexico Press, 1988. Hbk: $35.00; pbk: $19.95

PERIODICALS RECEIVED

ANNUAL REVIEW for 1987/88. London, Royal Commission on the Historical Monuments of England

BULLETIN ARCHÉOLOGIQUE du Comité des Travaux Historiques et Scientifique, Nouvelle Série 18. Fascicule B: Afrique du Nord. Paris, Éditions du C.T.H.S., 1988

BULLETIN of the Anglo-Israel Archaeological Society. Volume 7, 1987–8. London, 1988

NEW ZEALAND Journal of Archaeology. Volume 10, 1988. Dunedin, 1988

BOOK REVIEWS

THE AFRICAN ARCHAEOLOGICAL REVIEW, *Volume 5, 1987. Papers in honour of J. Desmond Clark*; edited by David W. Philipson and J.W.K. Harris. 207 pp. £25.00 (Institutions); £15.00 (Individuals)

These sixteen papers deriving from a conference held in Berkley in honour of the seventieth birthday of Professor J. Desmond Clark, range through much of Africa and deal with phenomena from australopithecine times to the present. Broad panoramas—as in Bladur Gabriel's reports on neolithic fireplaces in the Sahara—and the microscopic—e.g. 'Pottery tempered with sponge from the White Nile, Sudan' by D.A, Adamson, J.D. Clark and M.A.J. Williams—are included along with more standard medium close-ups.

Barbara Isaac examines the role missile-throwing may have had in human speciation, drawing inference from archaeological evidence and early ethnographic observations; while at the other side of the analytic spectrum Ingrid Herbich relates how techniques of potting are acquired in present Luo society in Zambia and how the personal popularity of an individual potter may quite widely influence styles of pot decoration because other potters will imitate her methods.

Most of the papers present new data or reassess previous interpretations, sometimes controversially, as with Francis B. Musonda's suggestions that 'exchange networks involving pottery between hunter-gatherers and food producers were non-existent in Zambia during the first millennium and the first few centuries of the second millennium AD ... ' (p. 156) and that the presence of sherds at Later Stone Age sites in the early centuries of the second millennium is due to the LSA foragers picking the sherds—probably for their intrinsic beauty—from abandoned Early Iron Age sites. Lack of pressure within respective environmental niches, lack of conflict between the respective contemporaneous life-styles, and known examples of active avoidance—rather than cooperation and exchange—between neighbouring societies of different life-style are cited as circumstantial evidence in favour of his findings.

James Anquandah's recent excavations of stone circle burial sites in Komaland in northern Ghana have produced grave goods as well as skeletons. Pottery, small milling equipment, metalwork of various kinds. terracotta sculptures, farm animal remains, cowies, etc were included with the interments. He hopes that future work will demonstrate 'that ancient Koma funerary custom required all clan relations of a deceased person to dump ... (p. 180) these objects on the tomb. As the dating evidence so far suggests an antiquity of no more than 500 years or so for the burials, it is not impossible that folk history and ethnographic data may enlighten the excavation evidence.

Modern ethnographic data and archaeological excavation were used in combination by Linda W. Donley in her investigations into Swahili coral houses in Lamu, Kenya. Here informants were able to interpret finds and features in her excavation of eighteenth century buildings' interiors because the style of use of these houses has probably remained largely unchanged.

In short, this collection must have made an extremely interesting birthday present for Professor Clark.

ALEX HOOPER

ANATOLICA. Vol. 15, 1988. *Special issue on the Aceramic Neolithic in S.E. Turkey: Round Table held on June 2–4 1986 in the Netherlands Historical Archaeological Institute at Istanbul;* edited by J. Roodenberg, Leiden: Nederlands Instituut voor het Nabije Oosten, 1988. vii, 232 pp; illus; H. Fl. 102.50

This handsome volume records the proceedings of a Round Table held on June 2–4 1986, in the Netherlands Historical Archaeological Institute at Istanbul.

The subject—the Aceramic Neolithic in Southeast Turkey (what J. Cauvin calls 'PPNB Tauride' i.e. prepottery neolithic B of the Taurus Mountains) is certainly worthy of such a conference on a number of hitherto almost unknown sites dug in recent years. These are Çayönü, Cafer Hüyük, Nevali Çori, Gritille and Hayaz, the last four to be flooded by two new Euphrates dams.

Geographically as well as culturally these sites belong to the Levantine Aceramic Neolithic tradition, even Cafer H. which 'near Malatya' lies on the Anatolian plateau, and obtained its obsidian from Çavusla near Bingl, well east of the Euphrates, and again on the plateau. The three more southern Euphrates sites predominantly used fine local flint. Chronologically these sites span PPNB, mostly the earlier phase, except the factory site of Hayaz. Whether the three building levels with oval huts in earliest Çayönü are accompanied by Early PPNB flints is not yet known; the type of building is more characteristic of the preceding PPNA of Mureybet III. J. Cauvin has drawn attention to the fact that at Cafer H., elements of this earlier aceramic neolithic persist into PPNB, like geometric microliths in flint, suggesting that the Tauride PPNB developed out of the North Syrian PPNA, which seems reasonable. He admits however that at Cafer H. there are more specifically Anatolian features which might derive from an earlier Anatolian culture, not yet recognised in the area.

D. Stordeur devotes an article to Mureybet and Anatolian traditions in worked bone, which may point in the same direction.

What one misses in this book are any but the briefest references to sites further west in Anatolia like AsIklI Hüyük, Çatal Hüyük or Can Hasan III, Suberde etc. Those south-central Anatolian sites now have a new neighbour and seem less remote from the Levantine tradition than before.

The obsidian industry of AsIklI H., albeit unstratified, looks to me as basically similar to that of Cafer H. and Nevali Çori, i.e. early PPNB and thus logically precedes that of Ceramic Neolithic Çatal Hüyük, contemporary with late PPNB. The unpublished deep sounding at the same site disclosed an Aceramic sequence (levels 1–12) with tools, mostly microlithic and in obsidian, that looks very Levantine, and seems closest to Mureybet Ia–III, thus spanning the Late (or latest) Natufian and PPNA periods.

The plan of the buildings is unknown, but rooms are at least 5.5 m. long or in diameter, built of mudbrick. They have burnished plaster or mud floors, and the walls were covered with lime plaster, with many traces of badly preserved wall paintings.

As E. Gordon who discovered the great mound of AsIklI H. in 1963 also found a round building of very similar size there, complete with red plaster floor and fragments of wall-paintings, it is possible that the pre-PPNB tradition of circular (and oval) structures survived later in Central Anatolia than in the Levant. The buildings, 12 of them superimposed in our sounding, could well have been of round (or oval) plan. There is one further source of information; the wall paintings of Çatal Hüyük that frequently show domed round house settlements, and contrast them with buildings of their own time, which are rectangular in plan. A few of these show the interior arangements of the round Mureybet III houses, a pretty sure sign of contacts in the past.

The Anatolian connection with the Levant is known to extend much further back than the

obsidian trade in Late Natufian (Mureybet) and PPNA Jericho, Nahal Oren, Mishremot and Nahal Lavan 109 site. As O. Bar-Yosef has shown it extends back to the Geometric Kebaran and the Natufian analogies with Belbas and Beldibi in the Antalya area. The Anatolian art tradition seems to go back to the period with engravings and paintings and art mobilier in caves and rockshelters. It reaches the plateau at the beginning of the Aceramic sequence at Çatal Hüyük with wallpainting and 'art sur plaquettes', occurs again at AsIklI in early PPNB and reaches its floruit in Çatal H. in the Ceramic neolithic, contemporary with Late PPNB.

In my mind there is no doubt that Anatolian and Levantine traditions were in fairly close contact over a very long period of time. What I do not believe is that Anatolia was 'colonised' from the Levant in the neolithic. The evidence as I know it, is against it.

Attention should be drawn to W. van Zeist's contribution to this volume and the interesting observation that it was man who decided what to eat, irrespective of the fact that other food sources were at hand. This is the earliest illustration yet of a Dutch proverb: 'Wat de boer niet kent, dat vreet hij niet' (what the peasant does not know he does not eat).

JAMES MELLAART

ARNOLD, C.J. *An archaeology of the early Anglo-Saxon kingdoms*. London: Routledge, 1988. xv, 224 pp; illus. Hbk: £27.00; pbk: £8.95

There has long been a need for a synthesis of purely Anglo-Saxon data and this C.J. Arnold has attempted in his latest work. He describes his aim as the study of 'the dynamics of a whole society' from 500–700, 'within the framework of the kingdoms'. This begins with an outline of the development of early Anglo-Saxon studies, followed by a chapter on rural settlement and economy, combined with overseas and internal exchange. The ensuing discussions focus on technology, religious beliefs (using mainly cemetery evidence), status, kinship and the evidence for kingdoms. The model that Arnold puts forward seems to be primarily economic, in which population growth and above all, the control of long-distance goods by the elite to maintain power, are seen as the main factors in social change.

Although Arnold takes a wide-ranging approach to the data, his theoretical base needs clearer definition. He starts by making a lengthy criticism of the culture-historical approach, with its over-emphasis on documentary sources and concentration on chronology-based typological artefact studies which have been the hallmark of Anglo-Saxon scholarship. Such criticisms have been made before, for example by T. Dickinson (1980) and C. Hills (1979), the difference being that Arnold offers no constructive approaches to dealing with these problems. These same chronologies and documentary evidence are later used as a basis for discussion without further detailed examination.

The model that Arnold puts forward, moreover, is not laid out fully until the summary and even then needs more explicit definition. The possible role of ideology during the pagan period in the maintenance of secular power is underplayed, despite its obvious importance later. He postulates that it is primarily the accumulation of wealth that develops administration, the move towards a market-based economy, with greater social stratification, labour specialisation, and a change from a kin-based to a land-based economy. Although he is apparently influenced by Hodges (1982), and the language he uses is similar to that of systems theory found in his earlier papers, it is unclear whether this is the basis of his approach in this book. His examination of cemetery data further seems to belong to the school of New Archaeology, with reference to 'social persona', but he also makes use of structuralist studies. Nowhere does he clearly define the

differences in these approaches. His loose use of the word 'symbolism' seems to be applied only to mortuary material, and not to other aspects. Pader's approach, (1982), which would argue that all the items in a grave should be considered together with their positions in the grave is described by Arnold, but is nowhere adopted by him.

Another major citicism of his work is that he applies his somewhat ill-defined model in a rather over-simplified manner. In no one area are all the elements of his model present. This is, of course, a reflection of inadequate data, which at the moment can only provide a palimpsest, incapable of demonstrating his 'cyclical kingdoms'. There is a great need for more regional surveys, but these problems cannot excuse his inadequate consideration of potential variation in the development of kingdoms. For example, we are presented with evidence of changing soil use, but only at a generalised level. There is no discussion of possible bias from the use of different methods to detect sites, such as air photography or fieldwalking. Apparent centres of population may indicate the nuclei of kingdoms but cannot be demonstrated clearly in maps which conflate two hundred years of evidence. He seems to have overlooked the important article by Scull (in *Germania,* 1986), which argued that finds of weights and balances represent not only a development of exchange, but also administration, supervising the payment of jurisdictional fines and even military payments. Arnold sees these objects as simply for overseas trade. The inhumation material is also used as a basis for very generalised statements, for example in terms of wealth or the aggressiveness of kingdoms, without looking deeply at other aspects, such as age, which he had already argued should play a significant role in mortuary data. These omissions must create a degree of error in interpretation.

There is again over-simplification in his consideration of the distribution of overseas artefacts. Arnold attributes this solely to political alliance in his discussion, (heavily reliant on Huggett, now published in *Med. Arch.,* 1988). Unlike Huggett however, and despite his own examination of some of the documentary incidence of warfare, he does not fully consider other possible reasons for these distributions. Possible settlement by Franks or Scandinavians, for example, is not discussed at any length. Reciprocity between elites is assumed to build wealth despite possible levelling mechanisms in redistribution to retainers, such as ring giving. There is no distinction made between royalty and other broader elites engaged in 'trade', despite arguments made by Hawkes (1982), for the important role of the nobility in Kent in this sphere before the late sixteenth century.

The closest we come to a model of the archaeological record to be expected from a kin-based society, (apart from a brief look at regional studies), is the placing of polygons around rich burials in the South of England. We cannot assume that these burials lie in the centre of kingdoms, and it is unclear which of the graves he lists as 'rich' appear on his maps. The relationship of his patterns to the documentary evidence is not fully explored. Even if, for example, his polygons have some meaning, the great complexity of kingdoms, sub-kingdoms and independent peoples found in the Tribal Hidage does not lead him to discuss what level of organisation or identity he may have isolated here. Surely some discussion of how group affiliation is shown, on the lines of Hodder's work, would be appropriate.

Arnold makes some omissions of important works in his bibliography. He also demonstrates a degree of carelessness, for a check of just half revealed 15 mistakes. Even his own work in Renfrew and Shennan (1982) is listed incorrectly. Far more worrying is the misattribution of sources. For example discussing settlement shift at Mucking without mentioning the scholar involved.

Despite these faults he makes interesting use of unpublished theses for looking at, for example, buckets, Style I ornament, and wear

patterns on brooches. It pulls together recent research in a field where little synthesis has been done. The general picture that he presents is plausible in outline, but his use of the data is not—this book should provide discussion, if only to refute it.

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DIDO CLARK

BARNETT, R.D. and **MENDLESON**, C. (eds) *Tharros: catalogue of material in the British Museum from Phoenician and other tombs at Tharros, Sardinia;* with contributions by R.D. Barnett [et al.]. London: British Museum Publications, 1987. 270 pp; 154 pp of plates; 43 figs; 4 maps. £95.00.

Ever since 1856, when the British Museum acquired a rich collection of antiquities from the cemetery which served the city of Tharros in Sardinia, first in the Phoenician and Punic, and then during the Roman and Byzantine periods, scholarly attention has been drawn to the objects and in particular the jewellery which were found there. However, while individual items were discussed in many publications, no systematic account presenting them all in their proper contexts has been available up to the present. Thanks to the effort of the late Dr. R.D. Barnett, this gap has now been filled: he assembled the material (which had been located in more than one Department in the British Museum), invited an impressive gathering of specialists to write on its various aspects and prepared the volume jointly with his co-editor, Mrs. C. Mendleson. Together they have made available to the scholarly world a catalogue which is comprehensive, splendidly produced, and which moreover, in view of the detailed comparative treatment applied by the specialist contributors, can also serve as a work of reference of considerable usefulness.

In plan the book is both systematic and detailed. After preliminary matter—abbreviations, lists of illustrations, foreword and preface—the first major section *(Introduction)* deals in turn with the city and site of Tharros, described by the late Soprintendente F. Barreca, and then with the nineteenth century excavations at Tharros, followed by a report on the burial (a survey and analysis), both by Dr. Barnett. These contributions are supported by full sets of notes and illustrations, as are those in the next main section *(The Finds, General Discussions)*. In this, the heart of the book, there are altogether

ten entries, some sub-divided. First, under *Pottery,* we find a discussion of Phoenician and Punic ceramics by T.C. Mitchell, followed by a report on Greek and Roman pottery by B.A. Sparkes. Next, *Terracottas* are dealt with by R.A. Higgens, *A Fayence Hedgehog Vase* by V. Webb, *Glass* by D.B. Harden, and the *Jewellery* for which Tharros has long been famous is dealt with, under a number of types, by G. Pisano. *Scarabs and Seals,* another important field, are divided into *Egyptian and Egyptianising* (dealt with by C. Mendleson), *Greek, Punic and Related Types* (by J. Boardman); *Scientific Examination,* dealing with the identification of materials used for the above, is contributed by A.D. Baynes-Cope and M. Bimson. *Amulets* (another important field) are reported on by C. Mendleson, *Coins* by G.K. Jenkins, *Bronze Arrowheads* by J.E. Curtis, and *Shells and Bones* by P.A. Orkin.

This analytical part of the work is followed by plates 1–72, and then by the third major section, namely the *Catalogue of Tomb Groups* (seventy-one in all). The contents of all these are carefully described in considerable detail under various headings such as *pottery, personal ornaments,* etc. An Appendix, *Materials from Tharros Lacking Precise Attribution* reports, firstly, on *Red-Slipped and Roman Fine Wares* (discussed by J. Bird) and then, respectively, on *Objects of Iron and Bone,* and on *Other Materials* (both by C. Mendleson). A *Concordance of Museum Numbers,* an *Index,* and plates 73–154 conclude the work.

It will be clear from what has been said that in this book an important body of information is presented in truly exemplary fashion. Line drawings and photographs of high quality support the text, which is printed on excellent paper, most helpfully. In addition, the discussion to which the material is subjected is of a very high standard indeed—as might be expected from such a gathering of highly qualified specialists. This applies in particular to the way in which the comparative background has been systematically referred to. Analogies in the central and western Mediterranean as well as those occuring in Cyprus and Egypt are pointed out in particular. Though, understandably, not all outside parallels are listed, the Report lends itself, accordingly, to use as an up-to-date work of scholarly reference. Regrettably, the need to hand in the manuscript on time prevented systematic reference to the recent Italian excavations at Tharros. At some later date it will be desirable, and interesting, to compare in particular the pottery from the latter with that recovered a century earlier in the tombs. For the moment, however, great thanks are due to all concerned in producing this outstanding work, which is pleasingly free from misprints.

B.S.J. ISSERLIN

BELL, Martin and **LIMBREY**, Susan, (eds) *Archaeological aspects of woodland ecology.* Oxford: British Archaeological Reports, 1982. 333 pp; illus. (BAR International series, 146; Symposia of the Association for Environmental Archaeology, no. 2) £14.00

The majority of the papers in this volume were presented at the third symposium of the Association for Environmental Archaeology held at Bristol in September 1981. The membership of the association is comprised of professional specialists from a diverse range of environmental aspects of archaeology. This collection of twenty papers reflects some of the specific interests of the membership.

The main topic of the symposium concerns the relationship between the archaeological landscape and the physical and biological landscape as it pertains to woodland environment. A variety of topics are discussed, including palynology, entymology, dendrochronology, and animal husbandry. As in previous symposia, locations are broadly based. These include studies in Ireland, Greece, the Western Mediterranean, Anatolia, Denmark

and Italy, as well as various regions of England where few analyses have been previously conducted.

The first part of the volume concerns evidence which attempts to reconstruct the nature of early woodland. An equal portion of the volume is devoted to botanical and archaeological evidence which is used to illustrate how man may have utilised and manipulated the woodland ecology. The final group of papers represent syntheses from archaeological and faunal evidence.

The papers by Girling and Limbrey emphasise the importance of fossil insect analyses to any reconstruction of early ecologies. These studies are not site specific and are therefore broadly applicable. Morgan presents an easily followed step by step review of dendrochronological research techniques often assumed by other authors. A number of authors (including Grieg and Girling) express the under estimation of the importance of the lime tree in the early woodland environment. Coy discusses the problems involved in the identification of Pleistocene mammalian assemblages which might lead to more reliable evidence for such topics as animal size change and the benefits of woodland clearing to certain wild species. Coy and Grigson present the results of their research concerning the utilisation of woodland by domesticated animals, while the paper by Noddle concerns the extent to which we may use mammals as evidence for woodland.

Archaeological investigations into woodland ecology are a vital issue not only to those researching in England, but in nearly every habitable place on this planet which is either at present or in the past was part of the woodland ecology. This publication offers a selection of the variety of topics and results which can be produced. Perhaps this report will stimulate further archaeological investigations concerning the woodland ecology.

WAYNE H. BONNER

Editor's note. *Since this review was written the hope expressed in the final sentence has been nore than fulfilled, notable by Oliver Rackham's* History of the countryside *(Dent, 1986).*

BEN-Tor, Amnon and **PORTUGALI**, Y. *Tell Qiri: a village in the Jezreel valley: report of the archaeological excavations 1975–1977.* Jerusalem: The Institute of Archaeology, the Hebrew University, 1987. xix, 299 pp; 67 plans; 86 photos; 76 figs; 26 tables. (Archaeological Investigations in the Valley of Jezreel: the Yoqne'am regional report; QEDEM, 24) $41.00

This book is intended to be the first of a number of reports on archaeological investigation undertaken in pursuit of the Yoqne'am Regional Project—an overall investigation of the western part of the Jezreel valley. While Yoqne'am was a town mentioned in the Bible, the mound now known as Tell Qiri represents a village site located at the junction of Mount Carmel and the Jezreel plain. Excavations there are therefore of special interest as a contribution to the long neglected study of non-urban settlements of the biblical period. The three campaigns of digging concerned here were in the nature of a rescue operation: the tell was being progressively destroyed by building in the Kibbutz Hazorea located on it, half of the mound having gone before investigations started, and digging having to be restricted to a number of disconnected sites still available. In spite of this handicap, the results achieved are important.

The book is arranged in three parts. The first of these deals with remains from the medieval down to the Persian period. Finds here are of greater interest than architectural remains, and in addition to competent treatment of pottery etc. there is a chapter by D. Barag on rather unusual fragments of Roman glass, and another by B. Arensburg on human remains

from the cemetery of the Persian period. The latter are discussed within a wider comparative framework, with reference specially to what is known about early Jewish skeltal and cranial features. (Why the cranial remains from Lachish should be regarded as non-Jewish, and those from Megiddo left out of the discussion, is puzzling.)

Part two, the Iron Age, is the main part of the book, strata concerned here comprising remains of a substantial building sequence extending from the 11th to 8th century BC, and which included public buildings with some religious functions as well as private housing. Treatment is detailed and comprehensive. The most substantial chapter is the one on pottery by M. Hunt. Illustrated by excellent drawings and photographs, it offers new classification of the material based in particular on the complete study of all excavated rim types and the analysis of their frequencies in the various phases. Analogies with other northern Israelite Iron Age forms are also noticed. The results are sometimes surprising: thus there is remarkably little difference between the pottery found at the urban site of Yoqne'am and the village ceramics at Tell Qiri. That the only known Euboean Greek sherd known in the region should have turned up at rural Tell Qiri is likewise remarkable.

Other chapters in this part also contain interesting matter. One may perhaps mention in particular a report on an iron axe of the 11th/10th century which had undergone deliberate carburisation, by R. Maddin, J.D. Muhly and T. Stech; a study of lithic material, especially sickle flints (which rarely receive sufficient attention when found in Iron Age contexts) by S.A. Rosen; and a discussion of architectural and environmental features, including the vilage plan and the presumed zoning of land use by Y. Portugali. Reports on pot marks resembling early alphabetic shapes, and on the botanical and zoological remains found are other valuable contributions.

Part three, The Early Periods, deals mainly with finds, there is little architecture. Late, Middle and Early Bronze, Chalcolithic and Neolithic finds, competently presented, make useful additions to regional and general knowledge.

The text is clear, and the illustrations are excellent throughout. There are a few criticisms. No attention is paid to maps, literature or gazeteers before the foundation of the State of Israel. Strata are discussed from the top levels downwards, which makes it difficult to follow developments. Most regretable, however, is the absence of large and detailed sections. Those given are very small and schematic: control of stratigraphic or locus attributions is not possible on this basis.

On the whole, however, this is a very important book, and its contribution to the study of regional and village features during the Israelite Iron Age in particular is significant. Future volumes in the series will be looked forward to with keen interest. Meanwhile, the authors have put us in their debt.

B.S.J. ISSERLIN

BIBLIOGRAPHIES SUR L'AGE DU FER: edited by J-P. Millotte [et al.] Montagnac: Éditions Monique Mergoil, 1988. 1 vol. [330 pp] 21 x 10.5 cm. (Bibliographiers thematiques en archéologie, 1–8) FF 150.

Bibliographies in archaeology are none too plentiful, and this contribution to the genre is to be welcomed if for that reason alone; but this brave new attempt is a good deal more than that.

This book, which is slim, easy to handle and clearly designed to fit into pockets, is actually eight thematic bibliographies, each written by a (French) authority in the field. Publication was associated with the *12eme Colloque sur les Ages du Fer* at Quimper in 1988, and all eight bibliographies cover an aspect of that period. In order, these are: BTA 1: Millotte, J-P. *La vie quotidienne en Europe*

aux Ages des Métaux.; BTA 2: ROBIC, J-Y. *L'Age du Fer en Bretagne*; BTA 3: RANCOULE, G: *L'Age du Fer en Languedoc occidental et en Roussillon*.; BTA 4: GRACIA, D. *and* PY, M. *L'Age du Fer en Languedoc oriental*.; BTA 5: FEUGÉRE, M. *Les Fibules protohistoriques*. BTA 6: RAPIN, A. *L'armement au Deixième Age du Fer (Périod de La Tène)*,; BTA 7: BUSSIÉRE, J. Les lampes préromaines (VIII^{e}–1er s. av. J-C.).; BTA 8: FEUGÉRE, M. *Le verre préromain*. Thus it can be seen that within the periods under consideration, the first provides a useful introduction to the topic in its European context, while the next three refer to specific areas of France. This brings us to the half way mark and the rest of the bibliographies refer to significant artifacts. Naturally the bibliographies in the second half are much shorter in length than the rest but their very specialised nature must make them more rather than less useful on that account.

Each bibliography follows a comparable pattern. First the compiler makes some introductory remarks, then the abbreviations of periodicals cited are listed. Then comes the bibliography itself: a straightforward alphabetical listing by authors. Finally there are one or more indices. The four area bibliographies are more thoroughly indexed, both geographically and thematically. BTA 2 and 3 have useful maps. The shorter bibliographies or artifacts are more lightly indexed, but all have a geographical approach and BTA 7 also indexes museums as well as sites.

The bibliographies, which naturally include both monographs and periodical articles, range in date from the earlier parts of the nineteenth century to the early 1980s. No attempts has been made to produce annotated entries. This would have overloaded the work in more ways than one.

I have mentioned the practical size and shape of the volume; it is worth also mentioning that the typeface is clear and easy to read and the whole work a pleasure to look at and to use. The bibliographies are indexed along the fore-edge and so printed that each bibliography could be reprinted to stand alone. Michel Feugére and Monique Mergoil, who is better known on this side of the Channel as a bookseller specialising in archaeology, are to be commended for this enterprising venture and we look forward to the next volume in the series.

BRENDA M. COOK

BINKS, Gillian, **DYKE**, John and **DAGNALL**, Philip. *Visitors welcome: a manual on the presentation and interpretation of the archaeological excavations*; prepared for English Heritage by the Centre for Environmental Interpretation, Manchester Polytechnic. London: HMSO, 1988. [10], 162 pp; illus. £25.00

CLEERE, Henry (ed.) *Archaeological heritage management in the modern world. [Papers from the World Archaeological Congress held in Southampton, in 1986.]* London, Unwin Hyman, 1989. xxiv, 318 pp; illus. (One world archaeology, 9) £35.00

'The academic discipline of archaeology and the administrative function of archaeological heritage management are twins', says the Editor, introducing *AHMMW*. He goes on to identify four reasons for managing resources: ideology, education, tourism and research. His contributors then provide illustrations of practice from around the world. With regard to tourism and education, *VW* presents the state of the art in British archaeological site management. Both books are for specialists. *AHMMW* is part of the proceedings of the World Archaeological Congress. *VW* is published on behalf of 'English Heritage'. We are, indeed, creating 'a new profession of archaeological heritage manager' (*AHMMW*); and so these books are very 'useful' (*VW*); but it is all the more worrying that they share a basic weakness of theoretical scope. The present review covers them in turn.

AHMMW comprises 31 chapters in five parts: introduction; general issues in archaeological heritage management; descriptions of practice in various countries; case studies; and issues in training. Five of these articles are of world-wide scope, twelve wholly or partly about practice in the UK or USA, and the remainder about various other parts of the world; but there are no contributions about Islamic nations. The articles vary greatly in length.

Five general themes emerge as world-wide factors for management: economic development as a source of problems in conservation; expanding data bases; public provision for management; local attitudes to the heritage and non-legal modification of sites. From the descriptions of practice, most of which recount the history of management in respective countries, it seems that, on the whole, management has come about in response to the increasing yield of discoveries made in the course of developing land. It is a pity then, that contributors to this book did not consider 'the modern world' more carefully. For how do the general themes relate to the reasons for management? Is there universal agreement as to the intrinsic value of archaeology? Or is management developing for a variety of reasons extrinsic to archaeology, intrinsic, rather, to 'modernisation'? In some regions, archaeology and management are, indeed, 'twins', but, in others, they are heterogeneous orphans in the wake of 'modernisation'. That *AHMMW* skims past the broader reasons for the development of management reflects, no doubt, a common perception of more immediate problems: one persistent motif is the shortage of trained staff for coping with all the work; another is the need to improve arrangements for putting so much of our pious legislation to work on the ground. Yet this diligent concern about the mechanism of management begs another question: how does our work on the ground relate to local communities? Considering that, until recently, modern archaeology has been exclusively Western in character, it is no surprise that, in many parts of the world, public awareness of 'the' heritage is not wholly compatible with the outlook of professional managers. This discrepancy is apt to set latent contradictions off between the archaeological ethos and 'modernisation'. So important here is 'The 'cultural dimension' : the archaeological heritage could never be sealed off from the rest of the landscape, however many managers were trained; and the best way to avoid problems must be to engage the participation of local communities. More or less explicitly, indeed, several of the contributors acknowledge public interest as the principal foundation for heritage management; and some then invoke education as not only one of the ends of management but also a means to that end. Note, though, that, on account of cultural and ideological variation, there is little ground for generalising about education, either worldwide or, often, even at a national level.

So who should set the goals of management? Without abandoning universal principles, we can draw the moral that heritage managers themselves should be trained in anthropology and economics. For example, until we understand how to think about the 'modern' context of archaeological resources and about local cultures, we cannot deal wisely with non-archaeological exploitation of those resources. The ubiquitous problem of 'grave robbing' is the best case in point: *huaquerismo* is not necessarily a pejorative term (Peruvians sing a national anthem about it).

So what are archaeologists and heritage managers, and what is a management strategy? Or what are archaeological resources and what is archaeological knowledge? Just as *AHMMW* is strong on more immediate problems, so there is plenty of good discussion about the first pair of questions ; but, as *AHMMW* is weak on philosophical issues, so it lacks discussion of the cultural implications of management strategies. It is interesting, for instance, to compare the preservationist approaches propounded in chap's 1 and 3 with the discussion of sampling criteria in chap's

5–6; but the classical materialist paradigm remains implicit (though of chap. 2). Had the contributors crossed the two pairs of questions, distinguishing more systematically between our resources and the way that we treat them, we would have learned more about both aspects of the discipline. For example, there is hardly any sense of the possibilities for basing archaeological heritage management on non-Western principles. Or is that impossible?

AHMMW packs a great deal in, both of issues and striking cases. The contributors were briefed well: many of the articles speak to each other in the most rewarding way, especially those arranged to present complementary views of the same work. The contributors are frank, several constructively and very helpfully critical. The text is clearly organised and designed; but it has lots of printing errors.

If *AHMMW* is flimsy on theory, *VW* is quite innocent of theorising. It begins by pointing out that 'your dig offers ... a realistic story of discovering and unravelling the information held on and in the ground. It ... will provide an extra focus of interest for visitors and the local community, and they will be pleased to help' ('archaeologists have a responsibility to popularise their knowledge', *AHMMW*). *VW* comprises two parts: the first sets out principles of site presentation; the second is a 'Technical Appendix', a series of entries providing details of how to go about it. The contents, more specifically, are as follows: a section on 'Deciding the scale of provision ... Sorting out your objectives'; one on 'Who are your visitors? ... What to interpret' and how to catch visitors' interest; a section on media interpretation, with a lot of precise technical information appended (together, this section and the technical details make up half of the book); a brief section on school visits; a brief one on 'generating income from visitors', with technical information on 'setting up a trading company'; a brief section on 'grant aid and sponsorship', with details on sources; and a brief section on public relations and promotion. Although these are general principles, *VW* is for 'relatively low-cost provision': it rightly points out that a professional feasibility study is needed for more expensive projects. There are four main axes of advice: (a) methods of presentation, (b) designing hardware, (c) collaboration between the dig and other organisations, and (d) how to monitor project development. (a–b) *VW* insists that, for effective communication, you must think, first, of the visitors ('Most ... want an enjoyable and interesting time, with just a flavour of archaeology thrown in'. Methods of presentation are assessed with regard to suitability for various kinds of visitor and to cost and the number of visitors expected. *VW* covers both personal media, from guides to Theatre in Education, and impersonal media. It covers both continuous facilities (e.g. display cases) and periodic ones (e.g. open days). Because presentation attempts to convey specialised ideas to a lay audience (cf. *AHMMW*), *VW* rightly stresses that design is vitally important, and that this, in turn, demands the most careful thought and assessment. The Appendix gives specimen costings at 1987/8 prices. (c–d) Perhaps *VW*'s brightest aspect is the constant reminder to make the most of others' activities and interests—the latent talents of your own digging team, the neighbouring farmhouse that offers teas, local clubs, organisations that can help in kind, others that offer funds (like the costings, the information on sources of funding dates rapidly. Both the text and the handy 'memos' emphasise that one of the main skills in managing site interpretation is to keep constant awareness of all the possibilities at every stage of project development. Site presentation can easily be a full time job. Covering a great variety of possible situations, *VW* rarely gives specific advice or firm assessments of the options, rightly leaving that to readers' judgement of particular circumstances; but reference is made, throughout, to examples of good practice (especially Flag Fen, The Brooks, in Winchester, Maiden Castle, and the Greater Manchester Unit, but also overseas and in museums and other interpretive facilities). *VW* is

comprehensive. It is not to be expected that all of the detail in this manual is quite accurate (e.g. Tourist Board practice,); but it is more important that both parts are full of good ideas, sound tips, and helpful suggestions. In large measure, the book itself illlustrates what it preaches about systematic exposition set out with a generous design that is personable, witty, varied and consistent; but the page references in the Index are unreliable and the bibliography fails to include all the citations. If any book could explain how to interpret British sites for British visitors, *VW* would be the one.

An 'interest in the past ... is important for the nation's psychological health' (*AHMMW*). In the Foreword to *VW*, 'English Heritage' acknowledges 'a duty to educate and ... stimulate interest in our archaeological heritage ... to provide value for the money which society makes available for its preservation and recording'. So 'What values and assumptions should we ... be imposing' (*AHMMW*)? 'Heritage is ... a ... marketable commodity' (*VW* ; cf. *AHMMW* p. 267). Both books lack reflection on our (post-)modern situation. This naivete could cripple the entire project of heritage management. Yet to be reconciled are private leisure and public well-being; entertainment and education; access by means of commercial charges and access by right of paying tax; ultimately, too, the auto-regenerative 'free' market and the finite resources of our historical environment.

N. JAMES

BRUMFIEL, Elizabeth M. and **EARLE**, Timothy K. *Specialization, exchange and complex societies*. Cambridge: Cambridge University Press, 1987. 150 pp; illus. (New directions in archaeology) £25.00

ERICSON, Jonathon E. and **PURDY**, Barbara A. (eds). *Prehistoric quarries and lithic production*. Cambridge: Cambridge University Press, 1984. vii, 149 pp; illus. (New directions in archaeology) £25.00

The development of social approaches to archaeological evidence over the last decade has often involved an emphasis on exchange. In discussing the social context of exchange and distribution in prehistoric communities, the organisation of production has often been neglected. These two volumes in the Cambridge 'New Directions' series go some way towards adressing this problem: the first is concerned with the inter-relations between the organisation of production, the context of distribution and the structure of prehistoric social formations. As with other volumes in the series, these books are collections of papers by different authors, covering data from various cultural contexts, relating to the general theme. Ericson & Purdy's volume has a strong American bias: seven out of twelve case studies deal with material from North or Central America. Two papers (by Torrence and Gibson) deal with European data, but it is surprising that the volume includes no discussion of stone axe production or flint mining in the European Neolithic, which has attracted much interest in recent years. Brumfiel & Earle's volume is more heterogeneous, with discussions of American, European, Near Eastern, African and Japanese material.

The two volumes reflect radically different theoretical approaches. Ericson, in his introduction to the volume on prehistoric quarries, sets the tone for the papers to follow. Throughout this volume, the emphasis is on 'optimalisation', on 'decision making' in relation to 'consumer demand' and 'labour costs', and on the maximisation of 'benefits' (i.e. profit). Reading the papers by Ericson and Findlow & Bolognese in particular, one almost has the impression that prehistoric quarries were managed by graduates of the Harvard Business School, using the latest computer software to calculate supply, demand and profit forecasts. Nowhere is this adherance to formalist economics jusitifed, and this is my major criticism: the authors may reject the

substantivist position, but to ignore it simply won't do. Some of the papers (Gramly, Sappington, Torrence) are concerned with the archaeological recognition of different 'procurement strategies' (e.g. direct access, regional exchange etc.). These papers are clearly working along the same lines as Renfrew's seminal article (1975), though they focus on evidence from production sites rather than on dispersal patterns which form the basis of Renfrew's paper. Torrence's discussion of the organisation of obsidian production on Melos is stimulating, but none of these papers really goes beyond Renfrew's approach. Spence *et al.* are also concerned with procurement strategies, but they do not attempt to go further in terms of discussing the social context of production and distribution, arguing for state control of obsidian production at Teotihuacan. Gibson's discussion of the organisation of flint production in the French Upper Palaeolithic is also stimulating, but these papers just give tantalising hints as to the potential interest of lithic studies. On the whole, I found this a disappointing volume: perhaps, to be fair, this merely reflects my own theoretical bias, but I was hoping for a discussion of the social organisation of production systems which would complement the discussions of exchange to be found in other volumes (cf. Sabloff & Lamberg-Karlovsky (eds), 1975; Renfrew & Shennan (eds), 1982), and this I did not find: there is too much covering of old ground, too many new applications of old ideas and too much use of simplistic and inappropriate theory.

Brumfiel & Earle's volume starts from a very different theoretical position. In their introduction, the editors discuss three types of model current in the archaeological literature on specialisation and exchange: these models are characterised repectively as commercial, adaptionist and political. A good critique is presented of the commercial model, which I have already criticised in relation to papers in Ericson & Purdy's volume. Almost all of the papers in *Specialisation, exchange and complex societies* take a political approach, though Muller, in dicussing Mississippian exchange and economy, tries to hedge his bets between 'political' and 'adaptionist' interpretations. Brumfiel & Earle propose a number of distinctions, e.g. between subsistence goods and wealth, between independent and attached specialists and between staple and wealth finance, and whilst these categories are very general indeed, they are useful in certain cases. Gilman, for example, convincingly uses the distinction between control of subsistence production and control of wealth to explain contrasts in the Chalcolithic sequences of the Almerian region of Spain and the Tagus area of Portugal.

Throughout this volume the emphasis is on the social relations of production, the social context of exchange and distribution and the significance of these factors in the development of social complexity. It would have been interesting to see more consideration of these factors in relation to the lithic production systems discussed in Ericons & Purdy's volume. The papers in *Specialisation, exchange and complex societies* offer stimulating and original approaches to these questions, but I do feel that some of the authors cramp their own style by their adherence to restrictive forms of positivist epistemology. Approaches (such as adaptivism), which could be criticised on basic theoretical and philosophical grounds, are rejected only after it becomes clear that they do not fit with the data (see, for example, the papers by Earle, Brumfiel and Galvin): surely archaeological interpretation can go beyond this level of empiricism in the light of the theoretical debates of the last few years?

One criticism that can be (and frequently is) made of the 'New Directions' series is that the volumes are almost prohibitively expensive (the two books reviewed here retail at £30.00 each). Many of the volumes in the series feature prominantly on undergraduate reading lists, and given the well publicised problems of student finance in Britain, I feel that a strong case could be made for paperback editions.

Given the stated aims of the series, however, the expense can perhaps be justified if the volumes do offer genuinely new approaches to major questions of archaeological interpretation: in my opinion this is the case with *Specialisation, exchange and complex societies*, but for the reasons outlined above I am less certain about *Prehistoric quarries and lithic production.*

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MARK PATTON

THE CAMBRIDGE HISTORY OF IRAN. *Vol. 2: The Median and Achaemenian periods;* edited by Ilya Gershevitch [sic]. Cambridge: Cambridge University Press, 1985. xvii, 946 pp; illus. £55.00

This volume of the Cambridge Ancient History of Iran, edited by Professor Ilya Ghershevitch, covers the history of ancient Iran from the Elamite period to Alexander the Great's conquest and includes the important Median and Achaemenid periods. It was published in 1985 and has an impressive list of contributors. The chapters are mostly by distinguished scholars in the field of Iranian Studies and related subjects, both still alive and now deceased. Among the latter are the late T. Slimirski (ch. 4: The Scyths), Sir Max Mallowan (ch. 7: Cyrus the Great), A.L. Oppenheim (ch. 10: The Babylonian Evidence of Achaemenian Rule in Mesopotamia), R.T. Hallock (ch. 11: The Evidence of the Persepolis Tablets) and Willy Hartner (ch. 16: Old Iranian Calendars). Thus out of nineteen authors more than one quarter were already dead when this volume came out in 1985! This in no way diminishes the value of such an important volume, but simpy indicates the long preparation period for the publication of this volume, particularly as some of the contributors died in the late 1970s. Other evidence of this delay can be found, for example in the article by I.M.Diakonoff on Elam (ch. 1). In discussing the city-state of Anshan he locates it vaguely in the 'eastern mountains' (p. 5). This is the subject of a footnote by the editor who comments (n. 2) the 'The site of Anshan was discovered after Dr. Diakonoff wrote the present chapter, by John Hansman whose account of that city-state is printed below, as chapter 2'. It is difficult to imagine exactly how long before 1985 ch. 1 on Elam was written, particularly when one remembers that Hansman's identification of Tepe Malyan as Anshan dates back to 1970 (see J. Hansman, 'Elamites, Achaemenians and Anshan', *Iran* X, 1972, 101–24) and that the excavations at Tepe Malyan already began in 1971 (see W. Sumner, 'Excavations at Tall-i Malyun, 1971–2', *Iran* XII, 1974, 155–80). Amongst other editorial mishaps is the inconsistent way in which bibliographies are sometimes gathered at the end of chapters and sometimes not (chapters 2, 11, 13, 16).

Apart from the historical chapters already mentioned above and others on Persia and the Greeks (ch. 6), the Persian Occupation of Egypt (ch.9), the Old Eastern Iranian World View According to the Avesta (ch. 13), the Religion of Achaemenian Iran (ch. 14), Aramaic in the Achaemenian Empire (ch. 15) and Old Iranian Calendars (ch. 16), there are interesting sections on Achaemenid Coins, Weights and Measures (ch. 12), by A.D.H. Bivar and Plant Names by H.W. Bailey (Appendix 1).

The latter section of the volume deals with art and architecture. Included here are articles

by E. Porada on Classic Achaemenian Architecture and Sculpture (ch. 17), A. Farkas on the Behistun Relief (ch. 18), D. Stronach on Tepe Nuch-i Jan (ch. 19) and Pasargadae (ch. 20) and P.R.S. Moorey on Metalwork on Glyptic (ch. 21).

Finally it must be said that this volume of the *Cambridge History of Iran* has been partly overtaken by the recent publication of the Cambridge Ancient History, vol. IV (2nd ed.) *Persia, Greece and the Western Mediterranean*, which is not only well edited but also offers an excellent range of articles with up-to-date bibliographies and a superb separate volume of plates.

VESTA CURTIS

CASTLEDEN, Rodney. *The Stonehenge people: an exploration of life in Neolithic Britain, 4700–2000 BC*. London: Routledge & K. Paul, 1987. xiii, 282 pp; 42 plates; 76 figs. £14.95

There is no reason reason why someone who is not a professional archaeologist should not have a go at writing about archaeology. Rodney Castleden obviously believed this too when he set about writing a synthesis of the British Neolithic which would be, as he put it, 'more acceptable to general readers'. But before Mr Castleden embarked upon his project he might have done well to pause and and consider why there had not been such a volume from the pen of a professional—but he evidently did not, and this oversight was his first mistake.

It should perhaps be pointed out at the beginning that the title of this book is somewhat erroneous since the major features at Stonehenge—at least those which seem to have impressed themselves upon Castleden's mind—belong to what is generally known as the Bronze Age, whereas the author is writing about the Neolithic. But then, he is not too concerned with the chronology of events of the period he discusses—something which is evident throughout the entire volume.

The book is divided into four parts, parts1 (Settlement and Agriculture) and 2 (Industry, Technology and Communications) dealing with the material culture, while parts 3 (The Ceremonial Monuments) and 4 (People, Polity and Philosophy) enquire into the more difficult themes of social, political and religious aspects of the Neolithic—the fields which, in his view, are insufficiently tackled by archaeologists themselves; he states confidently that 'the method seems to have worked'.

In the first three parts (not two as Castleden suggests in his introduction) the reader is taken on a guided tour of the British Neolithic. However, since the author has so little regard for the sequence of events, the tour is a rather a temporal motley: sites, artefacts and monuments of widely separate chronologies and regions are lumped together according to the writer's fancy, and the reader gains little or no impression of the ways in which the economy, technology, crafts or settlement patterns have changed through time. Thus there is no coherent framework to which the final discussion can apply.

There is also the question of evidence and its interpretation. While it is understandable that a book aimed at the layman need not contain a vast quantity of evidence for different threads of argument, some evidence in support of at least the basic ideas would help the reader to appreciate the difficulties involved in interpreting archaeological data; indeed, it would also allow the reader to make up his or her own mind about the validity of certain assumptions. One example will suffice to illustrate the point. Castleden assures the reader that there is 'no evidence for interpreting Durrington as a religious centre of any kind' but that, to the contrary, it was 'a very substantial township of 900 people' and 'a full-scale proto-urban settlement'. He is, of course, entitled to his own opinion but he could point out to the reader that most archaeologists today would regard the Southern and Northern circles at

Durrington Walls not as the remains of roofed buildings but as arrangements of free-standing posts—arrangements which not only continue the idea of earlier structures on this site but which can be perceived at numerous other monuments with a complex sequence of timber uprights being replaced by standing stones—a phenomenon much more difficult to interpret but more likely to reflect the truth.

The discussion of ceremonial and burial monuments (part 3) once again bears little relation to the sequence in which the various traditions are known to have evolved and—in contrast to the assurances of the introduction—it is purely descriptive in character. The reader is frequently reminded of Neolithic Man's obsession with death—an arguable point—but no other intepretations are offered. One wonders why Castleden, who throughout the volume complains that archaeologists do not concern themselves enough with the social aspects of the Neolithic, makes no contribution to the prolific debate on the social significance of burial monuments that is taking place not only in Britain but throughout North-West Europe.

But it is the final part of the book (People, Polity and Philosophy) which must receive full marks for affectation. The chapter headings are even more pretentious than earlier in the volume and some are downright incomprehensible (who are The Laughing Children?). Neolithic society is portrayed as static (which it was not) and living a peaceful, idyllic existence, the evidence of strife and destruction on a number of Neolithic sites being dismissed as isolated incidents. The discussion is as wide-ranging as it is irrelevant, the ethnographic parallels and comparisons with other prehistoric cultures are staggering in their misuse and abuse. Even more significantly perhaps, the reader is not enlightened about any of the 'secrets' or 'mysteries' of the Neolithic.

The author's stated intention was to provide an update of, and substitute for, Professor Stuart Piggott's book 'Neolithic Cultures of the British Isles', which apparently 'makes rather dull reading for the layman' (p. 6). personally, I have never found Professor Piggott's writings dull nor do I know of anyone else (layman or professional) who has ever expressed a similar sentiment, although this could be merely a matter of literary taste. Irrespective of how outdated it has become through new discoveries and research, Professor Piggott's volume will remain a masterpiece with an assured place on many a bookshelf; such will not, I fear, be the fate of Rodney Castleden's egocentric trip. The book contributes nothing to the enlightenment of the layman but will succeed in offending even the most tolerant of archaeologists.

MAGDALENA S. MIDGELY

CLUTTON-BROCK, Juliet, and **GRIGSON**, Caroline (eds), *Animals and archaeology, 1: Hunters and their prey*. Oxford: British Archaeological Reports, 1983. ii, 350 pp; illus. (BAR International series 163) £14.00

CLUTTON-BROCK, Juliet, and **GRIGSON**, Caroline (eds), *Animals and archaeology, 3: Early herders and their flocks*. Oxford: British Archaeological Reports, 1984. ii, 410 pp; illus. (BAR International series 202) £20.00

GRIGSON, Caroline, and **CLUTTON-BROCK**, Juliet (eds), *Animals and archaeology, 4: Husbandry in Europe*. Oxford: British Archaeological Reports, 1984. ii, 269 pp; illus. (BAR International series 227) £17.00

I do not have much sympathy for most publications of conference papers. To start with, too often participants take part on the basis that their employers will pay provided that the employee presents a paper that will be published—so the poor conference organisers are blackmailed into publishing everything, almost regardless of merit. Alternatively, sponsorship of conferences can be dependent on publica-

tion rights—with similar implications. One consequence is that useful bits of work tend to be ever more widely scattered in ever more obscure and unobtainable publications. Surely, the proper place for publication of worthwhile studies is in appropriate journals—and the rest should not be published at all? And is it that I am getting geriatric, or are there really more and more journals with less and less that tempts one to take out a subscription?

Well, how do these three volumes, with their total of 77 papers and 1035 pages—originating in the 1982 International Council for Archaeozoology conference—match up to my curmudgeonly prejudices? Or, given the ICAZ's explicit strategy that it wanted to 'publish in full the majority of the papers that were presented to the meeting', how judicious was their decision?

One crude method of assessing these volumes is to sort the papers by their factual content: after all, zoology and zoologists are undoubtedly scientific (whatever archaeology and archaeologists may or may not claim to be), and the facts are the bricks on which science is built, and the reefs on which theories are wrecked. Assured in this way, the Tosh Quotient is about 15–20% in all of the volumes under review.

The first volume is somewhat dominated by East Africa, but also contains two interesting South American studies. There are characteristically stimulating papers by the late Glynn Isaac, and the very extant Sebastian Payne—the latter examining how some of the different sources of the bones found in caves can be identified and disentangled. Meldgaard's paper compares archaeology and ethnographic studies in Greenland: not the least of its attractions are the accompnaying illustrations. The adjacent paper by Guthrie on bone projectile points seems to be on the balance point between archaeology and zoology. Proceeding in an opposite direction—in certain respects—to a similar position, Altuna discusses the relationship between animal representations in cave art and the bones found in what is assumed to be the corresponding strata: his conclusions were a nasty surprise for me, and are all the better for being based on such extensive first-hand knowledge of the sites and their material!

Just as Crader's study of modern hippopotamus and elephant kills shed awkward light on some interpretations of certain early African archaeological sites, so Aaris-Sørenson, looking at the Neolithic in Denmark, shows how little bone survives to be recovered by archaeologists. Her findings seem to drive a horse and cart through some of the fundamental assumptions used in Clark and Yi's contribution. Similar problems and conclusions to Aaris-Sørenen's also recur in the third of these volumes; and one of the shortest but most stimulating papers in the second tome reviewed is Ducos' examinations of the implications of non-matching skeletal elements that 'ought to be found' in pairs. John Watson pointed out to me in the middle 1970s that this sort of evidence showed that far less of the site at Pincevent had actually been excavated than the director hoped. Now a computer-program (written in horrible old BASIC) is offered so that you can carry out your own auto-da-fé on MNI calculations.

Lauvergne's article on animal genetics in this second volume is another that one wishes were longer and more detailed—an unusual complaint.

Reading Chow's review of archaeozoological evidence from China, I was struck by the disparity between the quantity and quality of archaeozoological publications and the extent of progress in archaeozoology in China and Europe. Although archaeozoological (and archaeobotanical) reports of the standard that European students now almost take for granted are almost non-existent in the Chinese literature, any attempted synthesis of European neolithic archaeozoology would hardly be much more enlightening than this thumb-nail sketch of three thousand years of what one can only call 'Greater China'. Of course, the capacity for making such a synthesis is not the

only criterion of progress—but nor is it entirely irrelevant.

If the first volume has more on East Africa than one might have expected, this second volume harbours a vigourous little clutch—if that is the correct collective noun—of camel-fanciers. I am delighted to see the Old World camels receiving due attention after years of neglect; apart from welcoming Wapnish's critieria for separating *C. dromedarius* and *C. bactrianus* bones, one must also thank her for uncovering a blunder among the BM(NH) specimens. Nor are the New World camelids ignored, as there is a paper by Jane Wheeler on camelid hunting and domestication at high altitudes in the Andes.

Apart from two contributions in Indian archaeozoology, and one on the Iron Age of the Transvaal, the bulk of this volume is devoted to Near Eastern archaeozoology, with pride of place going to a major review by Meadow—though the contributions of Hesse, Davis, and Garrard are no less interesting.

With the final volume we are firmly settled in Europe, and my heart sank distinctly. This may be partly attributable to your reviewer's long-standing prejudice against anything more recent than the Bronze Age (about a third of the papers in this volume are concerned with more recent times—which has the psychological impact of a 60% dominance); and partly due to a perceptible rise in the Tosh Quotient; but also partly because of a distinct air of gallant failure. For instance Bartosiewicz's attempted reconstruction of Bronze Age Hungarian cattle uses measurements of astragali that yielded only a single significant (size-dominated) eigenvector, and which show no clearer sexual dimorphism than most other measurements of anatomical elements displaying differences between the sexes. Knowing that juveniles, cows, bulls, and steers might be present, suitable groupings can be made out—but, as usual, it would be hard to convince a determined sceptic that anything beyond a single messy population was represented. Of course, this is not Bartosiewicz's fault, and it is progress of a kind—and which of us has not had had a brainwave that ultimately turned out to be less than marvellous?—but to discuss the possible effects of climatic change on the size of cattle does seem a glorious example of straining at gnats when herds of elephant demand immediate attention.

Similarly, Noddle's extensive review of Iron Age and Roman stock-keeping confirms most of King's earlier conclusions: good—replicability is a basic requirement of real science. However the advances seem to be rather limited. Perhaps a rough-and-ready non-parametric quantification of the topographic and environmental parameters with which the economic data are being compared is necessary for the next stage of the study. The complications associated with differential recovery of animal bone would preclude any attempt to be very sophisticated. Indeed, perhaps the problems arising from differential recovery are a major reason for the dullness of so much post-Glacial European archaeozoology. I have long wondered whether John Watson's ideas on fragmentation analysis should be applied in reverse (as it were) and used to reduce (for comparative purposes) the evidence from archaezoologically meticulous excavations to a more average and mediocre standard, rather than extrapolating vast proportions of small animals that may have been missed.

At the other side of Europe, Udrescu's study of domestic animal bones from sites of a similar age-range confirm that the Romans had the same sort of impact on Iron Age Europe that Europeans have had in sub-Saharan Africa in the last couple of centuries. Maltby and Grant discuss some of the subtleties of archaeozoological interpretation involved when civilisation replaces subsistence in (respectively) Roman and Mediaeval Britain. Lasota-Moskalewska claims to identify an economic change around AD 1500—but might it not be simply because cattle bones are too big to grind underfoot in a courtyard and therefore tended to be picked up and thrown out of the door of the castle, while the other bones could be 'lost' without particular effort; and that it was an increase in squalor that took

place, not an economic change?

Grant (again) and Kühl discuss much more exotic archaeozoology: one examining the possibility of animal sacrifices in Iron-Age Britain; the other reviewing the non-human bones from cremations in Schleswig-Holstein, and how they changed between Bronze Age and Viking times—a concentrated feast for the reader, but not necessarily of funeral meals.

As it happened, I opened this volume in the middle of Nandris' ethnoarchaeological paper, and was transfixed by the observation that ' ... we may take the application of the r- and K- concept to archaeology as an import; and the capture of ethnography (in particular of its data base) by the export of archaeological concepts'. As I cogitated over the following paragraph (and especially its final sentence) my mind was invaded by a vision of a malodourous, cojok-clad Count Fred Moriarty (inexplicably disguised as Colin Renfrew) leading a Nandris-Gerund away into captivity. When this accultural phantasy between *Beyond our Ken, How to be topp,* and the *Goon Show* blossomed to include a gift-exchange involving Raquel Welch and the late Kenneth Williams, I hastily moved on before an intellectual melt-down could ensue; and plunged into Musil's claims of Magdalenian wolf domestication. One difficulty here is that, as Gordon Hillman has pointed out, 'domestication' is a term that in archaeology can only be applied to populations, not to individuals—and the material is extremely sparse, nor is it treated in a way that allows its assessment as part of a population—presumably also because of scarcity of evidence. I would have thought that taming of wolves would have preceded domestication by a long margin—but maybe the taming automatically gave rise to a kind of domestication at once. In any case, one would have thought that tamed wolves/proto-dogs would have been so valuable to late Palaeolithic hunters that Dumb Chums would have featured prominently in their works of art; but this does not appear to be the case.

Towards the end of this volume Baker contributes a thumbnail sketch of the pathological lesions of stock that might tell archaeozoologists something about how the animals had been used. I found it most enlightening, but I would have liked to have been told whether these lesions might be confused with other ones of quite different significance. It must also be noted that poor writing and bad punctuation have produced several quite avoidable ambiguities, and it is unneccesarily difficult to understand what Baker is trying to say.

The final contribution is one by Stallibrass on how foxes disrupt sheep skeletons, and comparing this with the skeletal selection caused by quotidian human activities: Brain's methods and ideas are playing an ever more important role in interpreting archaeozoological analyses.

All in all, these voumes seem to be a bit better than the usual run of conference papers, and (thanks to B.A.R.) much cheaper than average. None the less, I do think that the decision of the I.C.A.Z. was laudible. Authors as diverse as Kipling, Graves, and Solzhenitsyn agree that elimination does nothing but good. ('Remember, Graves—the rubbish bin is your best friend.') If the editor is to have any valid function whatever, he must be empowered to reject, and to demand revisions and exisions. I have already cited one specific case where the editors have not done their duty (or have been prevented from doing so). If the author does not realise that statements like 'the dynamic system of pastoral husbandry built up by the medieval historian may then contribute to formulating hypotheses, testing models, designing regional sampling programs and simulating pastoral systems in archaeozoology' are verbose and pretentious, and are capable of being expressed far more tersely and gracefully, then surely it is the editor's function to point this out? And if the I.C.A.Z. has prevented the editors from doing their job properly, they deserve a vote of censure. Editors arise! Do your job—or be abolished.

R.N.L.B. HUBBARD

COLLON, Dominique. *First Impressions: cylinder seals in the ancient Near East.* London: British Museum Publications, 1987. 208 pp; illus. £25.00

In 1939 Henri Frankfort published his book 'Cylinder Seals' which was the culmination of his work on the Diyala Seals. The book became a cornerstone in the study of the glyptic of the ancient Near East. In it Frankfort classified and interpreted the seals and his contribution has remained an outstanding reference to this day. However, since then, a good deal of new material has become available as seal impressions have been studied and cylinder seals have been excavated. Indeed attempts at chronological dating of certain periods (see Bibliography, Boehmer, R. M. 1965; Collon, D. 1975), or of particular workshops (Collon, D. 1982c) have been made. The time is certainly ripe for a new general book to be published. Dominique Collon is perhaps one of the most qualified archaeologists to undertake such a task, having written numerous books and articles on cylinder seals (see Bibliography p. 199).

The Book is divided into three parts. Part One traces the history, development and and styles of the seals from c. 3000 to 500 BC, covering the whole of the Ancient Near East. This wide distribution is due to the the fact that cylinder seals, a Mesopotamian invention, served as records and as such were impressed on clay. The shape of the cylinder was convenient to seal these documents,
so 'wherever cuneiform had spread so had the cylinder seal' p. 5.

The history of the seals has been divided into seven periods: I–VII, each subtitled with a general description of the age e.g. Period II City States. Here the author departs from the generally accepted divisions used by Frankfort and many after him based largely on the historical periods of Mesopotamia. This is understandable as the book deals with the whole of the Near East where variations and completely different styles depended on the economic, administrative and cultural requirements of each region. Such difference is best illustrated by period V: International Exchange. Three different administrations/governments (if not people) were contemporary within the boundary of Mesopotamia: Kassite, Hurrians and Assyrians.

Part Two, deals with 'Cylinder Seals and Society'. Society here is not only ancient. It discusses the formation of the Museum collections, the manufacturing of seals and the significance of the inscriptions.

Part Three, perhaps the most interesting, shows the part the seals play in revealing life, beliefs and the culture of their owners. The subjects on these seals were almost always of a religious nature, invariably showing a worshipper in the presence of the gods. The gods accompanied by their symbol have already been identified, Shamash holding the saw (the Sun God), Ishtar carrying her weapons (the War Goddess) and Ea with streams of water and fishes (the Water God). Many seals depict episodes from myths, but the author wisely refrains from interpreting or identifying the many unsolved figures or motifs, since she prefers not to speculate.

The seals in Parts Two and Three are arranged according the their subjects and not by their date. The date is given by its number e.g. Period IV. The general reader, for whom the book is intended, and who is not familiar with dating seals at a glance, would find it tiresome turning repeatedly to the table on p. 7. Perhaps the addition of the dates such as Period IV (8th century BC) would suffice. The plates and seal descriptions are conveniently placed within each section. In her numerous illustrations of 966 seals Collon commendably does not rely exclusively on the well known but includes many unfamiliar examples. She has drawn attention to many obscure references, which explains her lengthy bibliography of approximately 241 authors, where some authors have more than one entry e.g. Amiet, P. has 15 entries; Boehmer, R. 13 and Porada E.

23. This is certainly a considerable asset for students and scholars alike.

LAMIA AL-GAILANI-WERR

CONGRES NATIONAL DES SOCIETES SAVANTES. 111e, POITIERS, 1986. *Art et archéologie de l'Aquitaine septentrionale: actes du iiie Congrès national des sociétés savantes: section d'archéologie et d'histoire de l'art.* Paris: Editions du C.T.H.S., 1987. 276 pp; illus. FF 200

This Congress, which moves around France, takes in each time a suitably vague area for consideration; thus no one can really object that a conference based in Poitiers also considers the fate of the buildings of the convent of the Visitation at Limoges founded in 1643, the restoration of the cathedral at Sens in the middle of the 19th century, or, to jump back a few thousand years, the geomorphology of the site at Saint-Romain-en-Gal, across the Rhône from the Roman city of Vienne. If we dispose of three of the papers on a medieval house at Saint-Germain de Calberte, an interesting discussion of the terminology of castles, fortified houses, refuges and manors in the area around medieval Angoulême, and an interim report on a motte and castle site at Dognon, that leaves a group of papers on the Roman archaeology and Romanesque art around Poitiers.

In the Roman section, Gérard Nicolini gives a practical summary of rescue excavation in Poitiers over the past 20 years. He takes us through the stratigraphy of four main sites, draws some of the pottery vital for dating, and gives some good, but provisional, bases for the archaeology of the city. This blossoms in the later first century, suffers major fire and destruction in the third quarter of the second century and shows little sign of problems at the orthodox time of the late third century. His emphasis on the point that this is what the archaeology says, that the major fire and destruction is archaeologically dated to the second century and not the third, as historians would want, is excellent. We have to wait for the final report before we know whether he is beyond criticism, but as interim statement it is very useful.

Marie-Noële Nicolini discusses mosaics around Poitiers and makes the interesting point that the earlier mosaics, which are black and white, seem to relate directly back to Italy, and so may involve Italian craftsmen, rather than a spread by copying from Narbonensis. But she does raise problems when she says a pavement is dated 'des années 50 par un tesson d'assiette du type Drag 15–17 de la Graufesenque trouvé sur la mosaïque et constiuant un terminus ante quem.' Christian Richard considers the evidence available for a rural settlement at Gué de Sciaux, Picard discusses the place of the Roman locals under the Roman Empire, and we are on to five Romanesque papers.

Dominique Poulain makes a very good case for bringing the paintings at Saint-Pierre-Les-Eglises back to the 9th century, by showing that what had been taken to be disorganization of a cycle of scenes is simply a cycle with an implicit message, rather than an obviously explicit one. Françoise Gaborit demonstrates that the well known paintings at Saint-Aignan at Brinay fit well on to a grid of 30 to 33 cm panels and hence gets closer to the painter's intentions. Marcia Kupfer (traduit de l'Américain) suggests how the cycle at Chalivoy-Milon ties in with the theology current in the 12th century and the seignural bargaining over tithes. Michel Dillange briefly summarizes Romanesque painting in the Vendée. And Perrine Mane gives an excellent summary of the calendars of months and seasons sculpted, for the most part, on the voussoirs of a series of churches around Poitiers and Saintes.

A varied bunch of papers which says that art and archaeology are well and thriving around Poitiers. In all, much more provoking than the bland summaries produced in Britain by the travels of the Royal Archaeological

Institute and the British Archaeologcial Association.

RICHARD REECE

DANIEL, Glyn and **RENFREW**, Colin. *The idea of prehistory*. New ed., Edinburgh: Edinburgh University Press, 1988. [6], 221 pp; illus. Hbk: £19.50; pbk: £5.95

Glyn Daniel's examination of the development of a concept of prehistory was aired in 1957 as a series of Josiah Mason lectures at Birmingham University. Since its publication in book form in 1962 it has become, I should think, the standard classic on the subject, at least in the English-speaking Old World. In this new version of the same title Daniel's view of the subject has remained essentially unmodified and Renfrew has added two new chapters to bring the original up to date. The two authors have collaborated to revise the appendix of recommended further reading. There are two questions to be considered, then: how does Daniel 1962 read thirty years on, and what of the two new chapters?

Renfrew closely follows the model of his Disney predecessor. Daniel closed his original version with two chapters, one on the (then) immediate past, and a finale on his particular concern, the relationship between archaeology and the public. Renfrew adds a matching pair, one of contemporary history and the new finale, 'Towards a World Prehistory'. Not unnaturally, perhaps, the weakest part of Daniel's review has proved to be the chapter on the period culminating in the 1950s, in which he was closely and personally involved, and of which it was most difficult for him a detached perspective. Renfrew eschews revision, and at all times defers to his former teacher. Thus we have no review of the 1930s to the 1950s with the benefit of hindsight, and very little linkage (apart from occasional asides) to show how the 1960s emerged out of the 1950s.

Renfrew's historical view of the progress of processual archaeology suffers from the same disadvantages as Daniel's chapter on his own times: Renfrew has been too intimately involved and also lacks the perspective of chronological long distance. Perhaps prehistorians, with their long-sighted gaze into the deep past, are poorly adapted to focus on the process of their own time. Renfrew's view is highly Anglophile with a reasonable seasoning of respect for colleagues in the United States (but not Canada). At least Bruce Trigger, that persistent Canadian critic, is mentioned, even if his work can sometimes be 'disappointingly naïve'. Clearly a book on this scale must be selective and must simplify, but is there not a single French, German, Italian, Danish or Dutch archaeologist to have made a contribution? To be sure, an anonymous group of French structuralists and post-structuralist is referred to once, but we are not given a single name, no example of their work, and no reference to a single published contribution. Are they dangerous, or is their folly to have written in a foreign language? The insularity of this chapter fits ill with the advertised theme of Renfrew's following chapter (towards a world prehistory).

At the start Renfrew seeks to adjust to Daniel's talkative, amusing, anecdotal, name-dropping, colourful style. Many of Renfrew's personal acquaintance, therefore, including burly Binford and tweedy Braidwood, are drawn in, and at first the direct quotations are many. But this is not echt-Renfrew, and the difficulty of treating such a subject as no-longer-new archaeology (with its unfortunate tendency to crocheted chains of polysyllables) soon drives him back to his natural, clear and uncluttered style, punctuated by quotations from Jacquetta Hawkes. Living through it, one was aware that the birth of new archaeology was much more deeply serious and much more complex than anything that had happened before; looking back on it Renfrew agrees that it was serious and that it was indeed as complex as it felt at the time. There is a welter of

developments and approaches which need to be introduced, but scarcely the space to pause and elucidate, exemplify or discuss. While the reviewer is old enough to be able to flesh out the allusions from memory, one wonders how much the first-year undergraduate reader, for example, will be able to pick up.

Renfrew's final chapter 'Towards a World Prehistory' is as polemical and personal as was Daniel's finale on archaeology and the public; it is therefore a matter of personal response as to whether one thinks his themes well-chosen or their treatment well-judged. Like the past, someone else's present can also seem a foreign country, where things are exasperatingly different.

The price of this book, unfortunately, requires comment. We have had Daniel's popular paperback for more than quarter of a century, and there are still plenty of copies in circulation, in libraries, in second-hand bookshops and in jumble-sales. Although it is dated, particularly in its last chapters (which have not in any case been revised), it remains valuable. When the first eight chapters can be picked up for 20 pence in Oxfam, we are asked to pay for fewer than fifty new pages at a rate of 40 pence per page. What chance is there, in a market-driven world, that the revised edition will replace the original?

TREVOR WATKINS

DE LAET, Sigfrid J. *La Belgique d'avant les romains*. Wettern: Editions Universa, 1982. 793 pp; 304 figs. FB 3200

The bulk of this volume, which calls for a strong wrist, belies its high readability. It makes a superb introduction to the prehistory of its area, which extends beyond the political boundaries of Belgium to include Luxembourg and adjacent parts of Holland and France. The author's scholarship, lucidity and exceptional gift for synthesis combine to produce a coherent, authoratative narrative of human settlement from Palaeolithic to Iron Age, always integrated into the contemporary natural environment and into the wider landscape of northwestern Europe as a whole. The text is enhanced by numerous plates, line drawings and diagrams.

The book fills the needs of both readers who seek an overview of the prehistory of the area and those who wish to investigate it further. Most important for the latter are the exhaustive bibliographies which conclude individual chapters. These would perhaps have been easier to consult had they been consolidated. All-in-all, however, the work is a major contribution to the prehistory of the Low Countries and to its understanding by outsiders.

FRANCES HEALY

DERRICOURT, Robin. *Man on the Kafue: the archaeology and history of the Itezhitezhi area of Zambia*. London: Ethnographica in association with the National Monuments Commission, Zambia, 1985. xvi, 252 pp; figs; tables; plates. ISBN 0 905788 22 2 £27.50

This report is the fruit of a survey, undertaken by Zambia National Monuments Commission, to glean the culture history of the area to be flooded by the raising of the Itezhitezhi dam on the Kafue River. While 'Archaeological research in much of Africa ... has concentrated on selected unusual sites of easy access ... [it] takes a special situation such as the construction of a dam to concentrate attention on the lesser sites and the full prehistory of a limited area' (p. 21)—and this is the task Robin Derricourt's team of Zambians, Britons and Americans undertook. An interdisciplinary approach was employed, involving ecological, archaeological, ethnographic, written and oral materials.

In recent times the people of the Itezhitezhi area have been following a mixed economy involving, among other things, agriculture, stock-rearing, fishing, hunting, gathering , and production and trading of such commodities as salt and iron. Modernisation is, of course, hurrying into the area: 'Beans and groundnuts are stored in large pots, although large tin cans increasingly tend to replace the old storage pots.' (p. 27). And, as Derricourt points out, '... while the older archaeological material may survive long for future study, the base for oral history work and for ethnographic studies of traditional patterns of society, economy and settlement is fast disappearing and the need for further detailed area studies is pressing.' (p. 24).

To an extent some of the patterns of activity can probably be projected back in time: nineteenth century trading systems, for instance, might be extended back to much earlier periods, but direct proof is very limited. Similarly, although the project's excavations revealed such expected finds as pottery, worked ivory and iron-working tuyeres, 'Fish remains are very scarce ... because of the way in which it is cooked. It is boiled for hours until all the bones are tender and can be chewed and swallowed, so fish bones would be discarded around the settlement only rarely.' (p. 29)

Other small surprises (at any rate, to the reader new to this culture area) are reported. For instance, some of the excavated clay smoking-pipes, traditionally fashioned by men although women are generally the potters in this region, are dated to before the sixteenth century AD, and 135 km further east along the Kafue a fragmentary smoking-pipe is ascribed to the thirteenth century AD. This clearly predates any post-Columbian introduction of tobacco to Zambia and, therefore, the best conclusion may be that an African substance was smoked in the pipes before the introduction of tobacco.

Variations from the pattern of events established for other areas of the region become apparent—e.g. the transition from Early Iron Age to Later Iron Age traditions of central Zambia and other areas is not exactly paralleled here—but on the whole the accepted hypotheses and working models for the region are broadly confirmed. In short, future research will greatly benefit from this richly detailed and successfully realised project.

ALEX HOOPER

DRISCOLL, Stephen T. and **NIEKE**, Margaret R. *Power and Politics in Early Medieval Britain and Ireland.* Edinburgh: Edinburgh University Press, 1988. 218 pp; illus. £27.50

The production of this volume in 1988 followed the reading of a selection of papers read at a Conference in Glasgow in 1984. Additional papers were commissioned on the main theme of the volume 'Power and Politics in Early Medieval Britain and Ireland'. The title itself indicates the very great range of potential aspects of study and, in a way, the volume does suffer slightly from that. The volume opens with an introductory paper by Driscoll and Nieke, the editors, which includes sweeping general statements about the relationship between archaeology and history, such as 'At the heart of the practice of historical archaeology lies an ambivalent relationship between the archaeologist and the artefact' (page 1) and depressing comments like '... especially if archaeologists are to make meaningful contributions to historical knowledge'. The volume does however overcome such a generalised and hollow-sounding beginning and the aim of the volume, as stated in the introduction, as an attempt to integrate historical and archaeological knowledge is addressed through various scholarly papers. The significance of some of the papers cannot be overstated, with most informative contributions by Nieke and Duncan on Dalriada and on Celtic Britain by Alcock, whose wide-ranging knowledge of the

area will form a useful discussion paper for students of the period. As indeed will the paper on Scottish towns by Spearman. Other contributions by Warner, Cramp, Hodges and Moreland, Arnold, Fisher and Richards are all loosely on the theme of the volume but to varying degrees and, in some cases rather difficult to read. The impression from some of the papers is that they are summaries of material more extensively (and perhaps more coherently?) published elswehere.

The concluding paper by Driscoll contains several truisms, such as '... the point is that the meanings of artefacts are defined by their social context' and '... making texts and making things are different sorts of human behaviour' (page 165). These are *so* obvious that one doubts the need for comment! This paper is also somewhat generalised but ambitious in what it sets out to do, and in this, in part reflects the nature of the volume.

I cannot help feeling a little disappointed about this volume and do wonder if a little more rigourous editing might have assisted in the coherence of the finished product. Nevertheless, it is a substantial contribution to work in the Early Medieval period and, despite the patchy quality of the drawings and the greyish photographs, it is a volume worth dipping into if not necessarily to be read from cover to cover.

COLLEEN E. BATEY

DYSON, Stephen L. *The Roman villas of Buccino: Wesleyan University excavations in Buccino, Italy, 1969–72*. Oxford: British Archaeological Reports, 1983. xiii, 197 pp; 356 figs. (BAR International series, 187) £25.00

The territory of ancient Volcei (Buccino) in Lucania was evidently a mixed landscape with a range of soils and resources which attracted settlement from early times. The excavations described in this volume succeeded in producing a picture of the history and appearance of no less than five villas suituated in the territory (as well as a medieval site). The most important conclusion drawn by Dyson on the basis of the excavations was that 'we have to look at Roman Buccino more as a self contained and self sufficient functioning community rather than as an area populated by scattered farmsteads or a few major estates where the rich found pleasure and profit'. Considering the relatively short time expended on the project, this is a worthwhile result.

The project laboured under difficulties of various kinds. The author admits his own inexperience and relative novelty of this kind of excavtion. Little attention was paid to economic evidence in the field, and no report on faunal remains could be obtained in time to feature in this volume. Moreover, the sites investigated were sometimes badly ploughdamaged, or obscured by buildings or trees; only at Vittimose, a rather comfortable residential farm, was anything approaching a complete plan achieved.

In these circumstances, to publish at all might be thought heroic. There are, however, ways in which the publication could have been made at once more useful and less cumbersome (and costly). The plans of the excavations, especially of Vittimose, are small and poorly reproduced; they should have been redrawn and better fitted to the BAR format. The trenches should have been marked in on the building plans, so that the few sections which are published could be properly keyed to the structure. A more detailed exposition of the actual circumstances of the excavations and how the different features were exposed would have made it easier to judge the reliability of the conclusions, which are too strictly divorced from the description of the features as excavated. On the other hand, it seems unnecessary to publish such a detailed catalogue of the finds since, apparently, nearly everything was recovered from unsealed deposits; the pottery in particular, should have been

briefly summarised, not listed piece by piece with dimensions, and need scarcely have been illustrated either. The layout of the text is extremely spacious, and could well have been condensed.

It is easy to be wise after the event, and Dyson himself says that things would be different now. Even so, it seems odd to this reader that more attempt was not made (at least on evidence of the publication) to locate robbed walls or buried deposits of earlier phases at some of the sites. Even on the ploughed-down sites, too, there must have been pits or dumps of datable material, lying to one side of the main structures, which could have helped to phase the structural sequence better. However, the Wesleyan project opened up a new area of the Roman world, and deserves study by anyone interested in the rural life of the Mediterranean region in classical times.

A.J.PARKER

EOGAN, George. *Excavation at Knowth I: Smaller passage tombs, Neolithic occupation and Beaker activity*. Dublin: Royal Irish Academy, 1984. xv, 358 pp; 119 figs; 88 plates. (Royal Irish Academy monographs in archaeology, 1) £24.00

'Excavations at Knowth I' is the first of three proposed volumes reporting on the extensive excavations by Professor G. Eogan of one of the most spectacular Neolithic complexes in Western Europe—the Knowth cemetery in the valley of the Boyne, in the Irish Republic. Begun in 1962, the excavations have continued ever since and a number of interim reports have dealt with selected aspects. Now the Royal Irish Academy's new series of archaeological monographs provides an excellent medium for a complete presentation of this long-standing project.

The present volume is divided into three parts. Part I describes all the small passage tombs which surround the principle mound at Knowth, part II deals with the traces of earlier (pre-cemetery) Neolithic settlement found to the west of the main mound, and part III describes the evidence for the later, Beaker activity at the site. There are three appendices: one on miscellaneous features, the second containing the results of Professor Groenman van Waateringe's pollen and seed analysis from various localities at Knowth; and, in the third, Professor J.C. Brindley discusses the results of the petrological examination of Beaker pottery from several sites in the Boyne valley.

Each of these three parts is further subdivided into two sections; a detailed description of evidence followed by a short discussion. Part I deals with the 17 passage tombs which surround the central mound. Although two principle types have been identified—those with a cruciform and those with an undifferentiated chamber—each tomb is described individually following clockwise from south-east to north-west. The description covers the principles of construction, burial, mound, kerb, finds, megalithic art and other relevant information. For each site with suffficient evidence there are two plans—one general and one more detailed with elevations; major sections are also published. Furthermore there are photographs illustrating major features and many finds are shown in drawings and occassionally photographs. Moreover, for each tomb where information was available, there are two tables showing dimensions and the type of stones used in the construction of the chamber and the outer kerb.

The description of pre-cemetery Neolithic features (part II) covers the subrectangular structure preserved beneath tomb no. 8, two palisade trenches and other features such as pits, hearths and tool-manufacture aeas. The Beaker occupation of the site (part III) comprises four separate areas of relatively intense activity with pits and fire places but apparently no structures which could be interpreted as houses. The features recovered in excavation are in all cases well documented in plans and

photographs and many of the finds, especially beaker pottery, are illustrated in drawings.

Thus throughout the volume there is a particularly strong emphasis on documentation. Professor Eogan has been very generous in providing evidence as full as possible—allowing readers to make up their own minds in respect of some of his conclusions.

It is perhaps this emphasis on documentation, as well as the fact that this is the first of the full Knowth excavation reports, that is responsible for the discussion sections being perhaps too short. Thus, for example, while the relationship between the two types of chamber at Knowth is touched upon, full discussion is clearly not possible until the central mound—containing both forms—has been published. Likewise, the fact that the megalithic art of the 'satelite' tombs was associated less with the kerbstones than is the case with the main tomb, cannot be fully evaluated. While the chronological indications for the earlier (pre-cemetery) as well as later (Beaker) occupation at Knowth are scanty, one would wish to know a little more about the possible causal relationship with the cemetery.

Perhaps Professor Eogan is saving the more detailed and wide-ranging discussion for later, once he has published the remainder of the excavation data. In this first volume he clearly chose to emphasise the documentary nature of his extensive investigations thereby providing us with one of the fullest accounts of a Neolithic cemetery complex. One awaits with anticipation the subsequent volumes.

MAGDALENA S. MIDGELEY

ESQUIEU, Yves. *Viviers, cité épsicopale: études archéologiques*. Lyon: Direction des Antiquités Historiques Rhône-Alpes, 1988. 127 pp; 85 figs. (Documents d'Archéologie en Rhône-Alpes, [1]) FF 87

This is the first of a newly furbished series which aims to give an attractive and informative account of recent archaeological work in the Rhône-Alpes region of the Antiquities service of France. At a price of less than £10.00 for 127 pages of highly informative text, well presented and printed, this counts as a bargain. Especially, as the editor notes, it covers work, some of which has only so far been published in local journals, magazines and reviews—dont l'accès n'est pas toujours aisé en bibliothèque.

Viviers is a town, half way between Lyon and the Camargue on the other side (west) of the Rhône from the old N7 and the autoroute. It has therefore been in the middle of a corridor between the world of the mediterranean and the centre of France until life started going faster, and then it was left to itself and has been little damaged. It has been the scene of several rescue excavations, a detailed study of the cathedral and cloister, some field walking, and a survey of early standing houses. This work is summarised in this volume with very worrying implications to those who still believe that British archaeology is uniquely superior.

The sections describe Viviers in antiquity; a cemetery church of the 5th–6th century outside the walls; the evolution of the cathedral area, and its cloister, from the third century AD to the present; the stratigraphy of the cloister area, animal bones, burials and burial rites; the human population from the bones; the pottery from the medieval burials; two recent bell moulds; and a note on the study of standing buildings in the lower town. Four appendices list the sigillata of 100 BC to AD 100, 4th to 7th century, amphorae, and coins.

There is not room to list all the good qualities of the text and pictures, instead a few points have to be selected almost at random. We are given the number of sherds in the levels preceding the rebuilt (very) early medieval church, both red-slipped wares, and stamped grey wares, and coarse pottery with drawings and directions to their layer of origin on a clear section, and the mention that a coin

of Jovinus (411–13) was found in the foundation trench. We can therefore do the dating for ourselves. The fact that the coins of Jovinus is illustrated upside down will worry only a few pedants. Although the animal bones are not very numerous there is an interesting attempt at analysis, with due warning of the smallness of the sample. In fact throughout the book we are constantly warned—but the sample is small, this date is provisional, there is really no good reason to believe this commonly held view—very refreshing. The animal bones, some of which are the result of Canons of the cathedral feasting, and others of which come from the secular lower town, do have differences. These show the Canons living mainly on very young pig and old cow with the locals much more into the sheep and goat. The burial of a pot by the shoulder of a corpse, possibly carrying holy water, is apparently fairly widespread. It gives the chance for a detailed and very sensible study of sequence, origin and date of a closely knit group of jugs.

From this preliminary study we begin to see the fascinating areas which are opening up in the archaeology of southern France, and especially the questions that will soon have to be asked. Under the Roman administration Viviers was a small settlement in the civitas of Alba, 14 km. NW, but Alba declined, the bishopric which had been founded there was transferred in the sixteenth century to Viviers, which then grew and survived. What is the sequence here? Was the bishopric only transferred after Viviers had overtaken its chief, and if so, what factors were causing the change in status of settlements? A whole area of investigation opens up which can be firmly based on the material evidence such as has been given to us throughout this book. I look forward, with congratulation and thanks, to much more.

RICHARD REECE

FIEDEL, Stuart J. *Prehistory of the Americas*. Cambridge, Cambridge University Press, 1987. x, 386 pp; 113 figs. Hbk: £30.00; pbk: £10.95

The American story to the sixteenth century comprises a distinct chapter of world history. The New World was first colonised during the late Pleistocene by a small number of hunters from Siberia, and, as their descendants spread and multipliied, they created civilisations in ways similar to their ever remoter cousins in the Old World. This comparison is important; and the American pattern is best appreciated by means of bicontinental synopsis prior to the study of particular cultures. Fiedel points out that students have lacked a satisfactory text book of such scope; and so he offers this one (for this and other remarks about his intentions refer to the Preface). How should we assess his offer? First, presumably, by a satisfactory text book we mean that: (i) it can be afforded; (ii) it is readable; (iii) it assumes little background among its readers; (iv) by summary and selected examples it describes the subject comprehensively and even-handedly with respect to (a) the prehistorical record and (b) issues of interpretation; and (v) it provides reliable leads into further reading. For years we have used the articles edited by Jesse Jennings (the latest edition of which is the double volume work, *Ancient ... Americans*). They fulfil our latter two criteria, but they demand some understanding of archaeological evidence; they are not uniformly easy to read; and they are expensive. Second, we expect the means of presentation to suit the purpose. Fiedel's purpose is thematic, which is apt to so large a subject. It would follow that the book's success depends on the relation between (iv) and (v) above; this probably calls for a case based approach; and, for an undergraduate level course, to succeed in that approach would set the book at an advantage over Jennings compendious tomes. Does Fiedel deserve to capture the market? The present reviewer tested the book in a general introduc-

tion to American prehistory for Birkbeck College.

Following our criteria above, the results of the test are as follows: (i) the price is attractive; (ii) Fiedel is easy to read (perhaps too easy); (iii) he makes no unreasonable presuppositions about readers' background. In Chapter 1, he sets the subject in historical context, highlighting the principal aspects of archaeological theory and methods (only, considering his later use of them, too brief on settlement patterns, and neglecting mortuary analysis).

(iv) (a) For one person to produce the synthesis required is an enormous task; and Fiedel has done it. That he has accomplished this without commitment to any particular interpretation or vision of the subject may, at first, recommend the book to some teachers. Three features distinguish his presentation. First, that principle of derivation and independence which is basic for comparing the New World with the Old is provided for in Chapter 2 by covering the World Paleolithic and focusing on the Upper Paleolithic of eastern Siberia as source of the first and principal colony to occupy America. Few others emphasise this perspective sufficiently. The second feature is his attempt to demonstrate the continuity from the later Archaic cultures into the Formative more clearly than the usual chronological and taxonomic division allows. This too is a good idea. Thirdly, he covers the rest of the story from Adena to the Aztecs and Incas in a single massive chapter. This is stupid.

The book comprises seven chapters. The first two have been mentioned. Chapter 3 covers all the evidence for the Pleistocene colonisation and then the Paleo-Indian period. Discussion of the colonisation is restricted to North America and Mexico: Pedra Furada and Monte Verde are only mentioned with the later South American evidence; so his prior assessment of the 'Pre-Clovis occupation' model (p. 59) is inadequate). Chapters 4 and 5 treat the Archaic and Formative cultures. Although this conceptual principle of continuity is helpful, Fiedel weakens the argument in two ways: he postpones systematic discussion of the development of sedentary life until the second of these two chapters; and then he distinguishes too strongly between 'The origins of agriculture and' of 'village life'. 'Theoretically, it is probably easiest to explain agriculture as emerging fom an already sedentary context' (p. 178): indeed; it is clear from Middle America and especially North America that technological development pends that of institutions (with some effort, students can work this out from Prehistory of the Americas). Yet Fiedel's problem shows in the wording itself, which obscures the likelihood that both sedentary life and cultivation developed through transitional phases. Chapter 6 is where he takes on not only the task set in his heading, 'the emergence of complex societies', but the rest of the story too. Why did he do it? First, as hinted in Chapters 4 and 5, he may have lost grasp of the relations between evidence and inference adduced in Chapter 1: overwhelmed, perhaps by information, did he misestimate the relative values for the late civilisations of archaeological and documentary evidence? Second, his misjudgement may reflect a methodological liability in the evolutionary theory that he espouses. To teachers, it may seem strange that Elman Service's typology should produce confusion; but does Service suit Fiedel's purpose? Finally, in Chapter 7, he makes a somewhat flaccid assessment of the merits of diffusionism and evolutionism in American prehistory.

Fiedel mentions all the main sites and finds, missing no information of consequence for such a book; but, in relying so heavily on Jennings' volumes, he produces some ill-digested parts. For example, a lucid synopsis of the Late Archaic in the Eastern Woodlands (pp. 95–7) is followed by a summary of J.B. Griffin's complicated catalogues; but the latter were not designed for the topics that Fiedel had introduced. This is an example of why a case based approach would work better. Of some help, then, are the maps; and so it is a pity that he eschews the chronological charts

that would complement them. Selection, of course, is a matter of emphasis as well as of filtering; and pictures do benefit archaeological text. There are no photographs but Fiedel dutifully provides line drawings. Not all are apt. None are good, several virtually uninterpretable. These illustrations (including several maps) are insults.

(iv) (b) Can one write such a book without some vision? Either despite or on account of his uncommitted stance, many of Fiedel's assertions fail to alert us to alternative interpretations with regard, for instance, to dates or population estimates. Although many passages are astute and felicitous, the rest is sprinkled with misjudgements: most are minor but some entail disproportionate effects for related dates (e.g. this link between Mississippian decline and beans, p. 255); some belong in a '1492 And All That' (e.g. p. 338, 'one of the most important functions' of Inca administration was to ply the 'labourers with ... chicha'); and several of them, frequently with respect to environmental determinism, are major fallacies. On the other hand, he does signal all the main issues and tends wisely to recommend conservative conclusions. Whether, however, for didactic reasons or because he has not thought about it, a still broader question haunts his lines. It induces a listlessness of style that blurs phenomena such as the rise of Teotihuacan or the 'dramatic decline' (sic, p. 294) of the Classic Maya. Hence the confusion about evolution. Is American prehistory 'ramps' or steps'? What is history?

(v) A text book should refer to further readings—not just other readings; but Fiedel's are neither regularly provided nor consistently valid (e.g. the National Geographic magazine). Most remarkable is his debt to Jennings' books.

As for the editing ... need we say more? *Prehistory of the Americas* is unfinished. Yet if it prompts a paperback edition of *Ancient ... Americans* it will have served us well.

N. JAMES

FINKELSTEIN, Israel *The archaeology of the Israelite settlement*. Jerusalem: Israel Exploration Society, 1988. 380 pp; 107 figs. $36.00

This major study of the Iron I culture concentrates on the hill country north of Jerusalem. An 'Introduction and History of Research' (Chapter 1), (including an outline of the aims of Finkelstein's own work) is followed by Part I: 'The Results of Excavations and Surveys', covering the later Israelite heartland, and Chapter 2: 'The Characteristics of Israelite Settlement Sites'. Part II: 'The Regional Study of the Territory of Ephraim', containing a preliminary report on Finkelstein's survey and his own excavations at Shiloh. Part III: 'Material Culture'; Chapter 6: 'Early Israelite Architecture' and Chapter to functional requirements (Amiran 1969: 191–2). The evidence can only be made to confirm Finkelstein's conclusions if the (assumed) incoming nomads bring no material culture with them, and adopt that of their sedentary neighbours wholesale. The probability of this is reduced by the fact that in the only well-documented case of a major resettlement (in the 19th century AD) of lands abandoned to the nomads (in the 16th century AD) the settlers moved from west to east, and were peasants from the settled region, not nomads from the steppes and/or desert (Lewis 1987; Aujaber 1989: 96–8). Finkelstein draws a picture of their resettlement (p. 347, note 41) diametrically opposed to that of Lewis and Aujaber. The entire 'peaceful infiltration hypothesis', to which Finkelstein subscribes, depends on the assumption that nomads, given a chance, will settle and become farmers. There is no ethnographic or historical evidence to support this assumption. On the contrary, the history of the Levant after AD 1516 shows that nomads used land captured from farmers for pasture, and whilst rarely settling it themselves actively discouraged others. His statement that 'we have yet to find a way to detect and identify the activities of non-sedentary group, es-

pecially in non-desert regions' (p. 343) may come as something of a surprise to prehistorians.

Finkelstein's argument that the 'pillared four-room house' is a skeuomorph of a bedouin tent suffers from a number of faults. Not least of which is the assumption that the form of the nomadic tent has remained unchanged for at least three thousand years—a view derived from the classic, and demonstrably false, hypothesis of the 'unchanging East'. The term 'four-roomed house' has been used so loosely that it has become possible to classify *any* Iron Age house from the territory of ancient Israel as a 'pillared four-room house', regardless of whether or not it has any pillars, and regardless of the number of its rooms. Taxonomically this is uninformative—as if we made no distinction between ceramic vessels other than 'Bronze Age'. Again, if this were as evolutionary sequence, as a number of scholars have argued, it should be borne out by stratigraphy, with 'developed' forms consistently later than 'primitive' forms (ignoring later continuations of the latter). As Braemer has clearly shown, this simply is not the case. Yet Finkelstein appears to want to use this supposed evolutionary sequence to order the material chronologically *in spite of the stratigraphic evidence* (p. 323). Ahlstrom's view of the origins of the Iron Age domestic architecture of Palestine, rejected by Finkelstein (p. 258) without discussion, is far more acceptable. The origin of Finkelstein's view lies in the *a priori* assumption that the Israelites came into the country from outside, and, therefore, that their material culture can have little or no connection with that of the previous inhabitants of the land. This argument is clearly circular. His attempt to derive the 'collar-rimmed' jar from MB II pithoi (pp. 283–4) is special pleading required by this *a priori* assumption.

His chapter on chronology (pp. 315–23) is lamentably short and selective. Although he first expresses doubts on the subject (p. 203), he later accepts (p. 321) that there must have been an overlap between the latest LB II (Canaanite) groups and the earliest Iron I (Israelite) groups, but thinks that it must have been quite short), because of the limited similarities between the material culture of the hill villages and the 'cities' of the plains (pp. 271–5, 338). Here he has made the mistake of comparing palaces with villages. Of course the variety of types of artefacts present in the villages is smaller (p. 271) than that in the homes of the ruling elite; what previous commentators have noted is that in the classes of artefacts which are present on both types of site the types present on both are similar. In the end, he dates the earliest Iron I sites to c.1200 BC (p. 322). What he fails to note is that the latest LB II sites, Beth Shan Lower level VI and Megiddo VII A, do not end earlier than 1150–1125 BC.

In contrast, his 'Regional Study of the Territory of Ephraim' presents a wealth of information. One can only hope that more such survey material will appear in the near future. His preliminary report on his excavations at Shiloh shows how well he has handled a difficult site, the centre of which is badly eroded. His argument that this was a cultic site in both MB and LB, while it involves retrojection of its Iron I status, is nevertheless persuasive. Curiously, he does not mention in this book the crude imitation of an Egyptian New Kingdom fly-amulet, found in the LB rubbish dump, which appears in some of the earlier preliminary reports. Perhaps the most important point of the doubts expressed above concerning his interpretation of the evidence is that they do not demonstrate his conclusions are wrong, only that they are not as conclusive as they might be. This is also true of all other interpretations of this evidence as Isserlin has shown. Until our models approach more closely the complexity of reality, and until the questions we ask are ingenious enough to permit only unambiguous answers, this will continue to be the case, whatever the 'school' to which we belong. The fact that Finkelstein presents, in some respects at least, a more complex treatment than has been the case in the past means

that his book is a step forward in our understanding of the material. The fact that he, like most of the rest of us, is still asking questions which cannot be given unambiguous answers shows how far we have yet to go.

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RUPERT CHAPMAN

GARRARD, Andrew. N. and **GEBEL**, Hans Georg. *The prehistory of Jordan: the state of research in 1986*. Oxford: British Archaeological Reports, 1988. 2 vols. ix, 1–285 pp; 286–601 pp; illus. (BAR International series, 396) £36.00

These papers are the result of a workshop held at Tübingen in April 1986 immediately following the Third International Conference on the History and Archaeology of Jordan, whose papers published by Dr Adnan Hadidi are also reviewed in this volume. The editors describe how their idea of a workshop to exchange and discuss the results of the great amount of early prehistoric research in progress turned towards a publication, for which the additional papers were solicited in the interests of complete coverage. There are 24 contributions, a number under multiple authorship. The subject of the papers is the environment and the prehistory of Jordan (east of the river) in the palaeolithic and neolithic periods.

The predominant impressions induced by these two weighty volumes are first of the enormous intensity of current research, especially bearing in mind that this volume relates to a limited land mass and a strictly limited period which excludes the chalcolithic, the Bronze Age and later, and the second of the broad perspective of many of the research projects. The wealth of information being produced by so many teams engaged in survey, landscape analysis and excavation is producing two effects: on the one hand 'extraordinary' sites ('Ain Ghazal or Basta) are no longer unique (contrast the situation of 30 years ago, when Jericho had no context), and on the other hand the flood of new information at last permits the regularities and, perhap even more informatively, the anomalies and lacunae to be identified. One can imagine perhaps the excitement of the workshop itself as these fascinating results began to accumulate and the points of relationship began to emerge. It was therefore interesting for this reviewer to be present at the Lyon colloque in May 1988, where many of those working in Jordan began to see a scene of similar intensity of research in SE Turkey with similarly exciting results. Near Eastern prehistory, at least here and there, as research windows have opened, is at last coming of age before our eyes.

Some of the essays here are written by the directors of team projects: other essays form clusters, the product of a new kind of multi-authored research projects. The significant observation concerning both types of strategy is that so many of the large projects are not focussed exclusively on a single site, but on one or more sites within a greater or lesser landscape. Another observation, which implies a considerable compliment to many contributors who also produced papers for Dr Hadidi's conference and publication, is that there is no pointless repetition bewteen the two books. For example Don Henry offers here thirty concentrated pages showing how the data from survey and excavation in the northern Hisma is being analysed, information an hypotheses are being extracted, and are then fed back into

the research programme. The project area coves a variety of sharply differentiated ecozones and a time-span from Lower Palaeolithic to Chalcolithic, a huge canvas within which to observe changing human cultural process and changing environment.

As examples of the multi-authored research projects one can do no better than cite those focussed on 'Ain Ghazal, Basta and the Petra area, and Andy Garrard's successful efforts to draw many others from different disciplines and with varied interests into the ambitious project in the Azraq basin. Each of these projects has produced several papers in this volume, and one knows that there are others elsewhere reflecting other aspects of their work. One example will suffice here: the excavations at 'Ain Ghazal over four years are first summarised by Rollefson and Simmons in terms of their often extraordinarily exciting results and the powerful emerging synthesis. Then Köller-Rollefson and her colleagues offer an essay on the first results of the analysis of the 50,000 identifiable faunal fragments from the stratified site, hinting at the (now confirmed) increasing concentration with time on certain species and the steep loss of wild species from an environment which by implication was being more and more intensively utilised and stressed. A complementary paper follows from Mandel and Simmons, in which their preliminary assessment of the site's geomorphology is discussed, with its cycle of phases of severe soil erosion from the slopes above the site and deposition within the site stratigraphy. The final paper in the group analyses the stratified series of burin types from the site and begins to relate these to the Desert Neolithic of Jordan.

There is not space to do justice to all the papers. Suffice it to say that almost everyone working in Jordan in the palaeolithic and neolithic periods has contributed, and that the essays are all archaeologically informative and in many cases of considerable importance in the development of our ability to comprehend prehistory. Collections of conference papers can be dull and lifeless affairs, or very variable in their quality. This collection is an exception, not least because of the enthusiasm of the two organisers of the workshop and editors of the publication. The broad and enthusiastic response which they have obtained from their colleagues is some mark of the good will in which they are held, and also of the atmosphere of international dialogue and cooperation which seems to be natural to those who work in the prehistory of Jordan.

TREVOR WATKINS

GIBBARD, Philip L. *The Pleistocene history of the Middle Thames Valley*. Cambridge: Cambridge University Press, 1986. vii, 155 pp; 62 figs; 8 tables. 42 x 30 cm. £45.00

The Thames Valley is one of the most important regions for British Pleistocene geology. This book looks in detail at the central Middle Thames area, which provides a classic type sequence of the Thames river terraces. Since the lower terrace deposits have produced significant assemblages of stone artefacts, an understanding of the Quartenary geology is vital to palaeolithic studies of the region. This synthesis of work to date is written in a clear and succinct fashion, and is an excellent reference book for both students and researchers.

A detailed description of the lithostratigraphy of 20 different sets of deposits from a variety of localities forms the bulk of the study, backed up with over 40 illustrations of sections and profiles. Then follow separate chapters discussing faunal assemblages from 12 sites; the palaeobotanical and biostratigraphic records from 13 sites; and the palaeolithic flint assemblages from 96 localities. The last two chapters outline the sequence of events which gave rise to the Pleistocene deposits described in the earlier chapters and then correlates these deposits with those encountered in neighbouring regions in the Thames catchment both up and downstream.

This is a useful book not only as an interdisciplinary summary of work to date but also, in defining the limitations of existing data available for study, in highlighting gaps or areas of uncertainty in the geological, palaeobotanical and archaeological record. The book thus gives a good pointer for future work. However, the size and shape of the book make it difficult to stack on library shelves and impossible to review on the train! Although high resolution illustrations are an essential accompaniment to a study of this nature, there are few instances where reduction would have led to a loss of detail or using a landscape format would have caused inconvenience to the reader. It is thus conceivable that this book will not be as widely purchased as it deserves to be.

ROBIN HOLGATE

GRÄSLUND, Bo. *The birth of prehistoric chronology: dating methods and dating systems in nineteenth-century Scandinavian archaeology*. Cambridge: Cambridge University Press, 1987, 132 pp; illus. (New studies in archaeology) £22.50

Scandinavians have for long been at the forefront of archaeological scholarship. Professor Gräslund's book shows just how far back this lead extends and how important the Scandinavian achievement has been. The central theme of the book is the development of 19th century chronological methods, especially between 1820 and 1870.

Gräslund devotes one chapter to the presentation of his own conceptual framework for the interpretation of the non-scientific dating procedure, defining 'type analogy' (the study of the physical properties of artefacts), and 'find analogy' (the spatial relations of artefacts), and emphasising the various levels of application. Then follows a brief discussion of the major museums (ch.3) and the specific role they play in Scandinavian archaeology. Gräslund suggests that, in contrast to the situation elsewhere in Europe, the 'centralisation' of Scandinavian collections in major museums created circumstances particularly favourable to the study of large collections of finds and was the main force in the development of scientific archaeology there.

Not surprisingly, the discussion on the developments in Scandinavia commences with Thomsen's Three Age System. There is a useful reminder that this division—into Stone, Bronze and Iron Ages—had been practically applied in the major Scandinavian museums for at least a decade prior to its explication in print. Gräslund suggests that, in contrast to the traditional view, Thomsen's Three Age System should be regarded neither as a preconceived idea nor as merely a practical, curatorial approach to the sorting out of the amorphous mass of museum collections. On the contrary, the essence of Thomsen's reasoning lies in the perception of find analogy; it was the result of a conscious observation of finds association—as Thomsen himself explained, of knowing 'what was found together and what not'.

The subsequent discussion embraces the progressive division of the Three Ages. While the contributions of such distinguished scholars as Jens Worsaae, Sophus Müller and Oscar Montelius provide the focus of discussion, their lesser-known but equally able colleagues—Nils Gustaf Bruzelius, Bror Emil Hildebrand, Hans Hildebrand and Emil Vedel to name but a few—emerge from relative obscurity. One gains a fair impression of the intellectual climate of mid-19th century Scandinavia, as well as an appreciation of how the work and ideas of the famous scholars 'rubbed off' on their colleagues and what, in turn, was their contribution to the debate; there are useful biographical notes at the end of the volume.

It is particularly interesting to be reminded that, throughout the period in question, 'pure typology' appears to have been less of a force than the knowledge and appreciation of find circumstances, and that the careful observa-

tion of archaeological facts played a much greater role than has generally been assumed. This emerges particularly clearly in Montelius' own explanation of his method when he states that the method ' consists not only in investigating all the known archaeological artefacts and their find circumstances but also in trying to gain all the information which can be obtained by a study of the internal connections of the types ... these two investigations should always proceed in parallel' (p. 88). Indeed, it was one of the lesser-known Scandinavian scholars, Hans Hildebrand, who, using his knowledge of numismatics, appears to have employed a 'purer' brand of typology than Montelius; Hildebrand was also the first to make regular archaeological use of such terms as 'type' and 'typology'.

In a publication such as this, dealing essentially with typo-chronological issues, it would have been very easy to lose sight of the principal characters and become submerged in a discourse of typological minutiae. It is to the credit of Professor Gräslund that, in his flowing (and well-translated) narrative, the typo-chronological issues are expertly interwoven with the personalities engagaed in these pursuits. The reader can sympathise with their involvement, convictions, occasional doubts and scholarly polemic such as took place, for example, between Müller and Montelius.

One may, however, dispute Gräslund's playing down of the role and the impact of evolutionary theory and, after the 1870's, of Darwinism upon Scandinavian archaeological thought. While such influences may have been largely implicit, it is difficult to imagine that Scandinavian scholars, who by and large obtained as good a university grounding in the natural sciences as in humanities, would not have incorporated at least some aspects of the evolutionary theory in their intellectual philosophy. After all, as Darwin found out to his cost when chided for acknowledging only thirty of his predecessors, the theory of evolution was already old hat.

In conclusion it is perhaps worthwhile to reflect that, in contrast to the impression gained from some modern typo-chronologists, the 19th century efforts do not appear ever to have been an aim in themselves; the subject of the study was artefacts, but its object was the cultural history of man.

Professor Gräslund's 'The Birth of Prehistoric Chronology' is a very good and readable account. It should be seen by all who engage in typo-chronological studies; it will enlighten students whose normal response to the mere mention of Montelius' Bronze Age scheme is a blank expression; and it is a valuable contribution to the history of archaeological dispute.

MAGDELENA S. MIDGELY

GULAINE, Jean (ed.) *L'age du cuivre européen: civilisations à vases campaniformes*. Paris: C.N.R.S., 1984. 245 pp; illus. FF 180

This is the long-awaited publication arising from the extensive discussions on the European Bell-Beaker complex at the 1976 UISPP Conference at Nice. It is, one must suppose, a statement of the current position of European Chalcolithic studies.

The colume consists of 15 papers, covering geographical areas ranging from Britain and Ireland (Case) through the Netherlands (van der Waals), Central Europe (Sangmeister, Behrens, Neustupny, Bill, Czarnetzki) and France (L'Helgouach, Guilaine) to Italy (Barfield, Montanari & Cremaschi), Iberia (Harrison, Soares & Tavares da Silva, Leitao et al.) and Morocco (Souville). Anglophone readers should not be discouraged by the French title; of the 15 papers, 7 are in English, 4 in French, 3 in German and 1 in Italian.

As a review and summary of the data this volume is of obvious importance; it is a definitive statement of the chronology and typology of Bell-Beakers and associated

artefacts, as understood at the time of publication. The volume covers most areas where beakers occur, including North Africa, so often ignored in studies of Mediterranean prehistory.

What is disappointing about this volume is that there appears to be little attempt to move beyond typology, chronology and description. In the introduction, Gulaine writes inspiringly; *'L'archéologie d'aujourd'hui, en ne se limitant pas à la démarche typologique ... en essayant de faire une plus grande place aux données écologiques, aux contextes socio-économiques ... nous a fait perdre beaucoup d'illusions'*.[1]

There is, however, little evidence for this in the volume; most of the papers limit themselves fairly rigidly to *la démarche typologique*, and only Neustupny makes any real attempt to understand the Bell-Beaker phenomenon in social terms. Many of the authors accept uncritically the notion that the 'Beaker package' represents an intrusive population. Far from having been abandoned, the illusions seem still to be with us; the illusion that an archaeological 'culture' and an ethnic entity are one and the same, the illusion that cultural change in a given society must come from outside, one could go on ...

The appearance of the Beaker package represents one of the most striking cultural changes in European prehistory; the proliferation of related assemblages over much of Europe, the appearance of metal objects, associated with changes in burial rite, ritual practice and settlement patterns. The period of transition beyond the Neolithic and the Bronze Age is one that ends itself to social interpretation, as witness recent publications by Shennan and Gilman (names conspicuously absent from this volume).

This does not, of course, detract from the book's value as a compilation of data; there can be no doubting its importance in this respect. Our understanding of Beaker chronology and typology has developed considerably over the last two decades, and the current understanding of these questions is well summarised by the contributors to this book. There is less evidence, however, to suggest that the conceptual and interpretational frameworks with which archaeologists approach their data have developed significantly since the early 1960's.

[1]Modern archaeology, in moving beyond the study of typology ... and increasingly emphasising the ecological and socioeconomic context of cultural change ... has forced us to abandon many illusions.

MARK PATTON

HADIDI, Adnan. *Studies in the history and archaeology of Jordan, III*. London: Routledge & K. Paul; Amman: Department of Antiquities, Hashemite Kingdom of Jordan, 1987. 343 pp; illus; maps on endpapers. £35.00

The third in the series of triennial conferences on Jordanian history and archaeology took place at Tübingen in April 1986, and prompt on its heels Dr. Adnan Hadidi has successfully brought the papers into print. The theme of the conference was 'trade, communications and international relations' and the time-span was down to the end of the Ottoman period. There are 42 contributors to the volume, of whom all except four have written in English (there are two papers each in Arabic and French). Dr. Adnan Hadidi is once again to be congratulated for ensuring such speedy publication, which was a prime objective of the exercise, and which requires deliberate editorial compromises. The compromise most noticeable in this volume is the order of contributions: there seems to be a first cycle of papers, which starts in the palaeolithic and runs the full gamut of periods, and then a second cycle which repeats the chronological sequence.

As is the way of things when participants are invited to a conference with a theme and each solicited to speak to a precisely defined

brief, some contributors address the theme more tangentially than others. The purpose of the publication, it would seem, is as much to make available up-to-date accounts of the progress of research from those actively engaged in the field as to obtain a coherent synthesis on 'trade, communications and international relations' through the ages.

Of the contributors who address the theme of the conference, Gary Rollefson, taking his lead from Andrew Moore's analysis of Tell Abu Hureyra as a regional centre of trade and exchange in the aceramic neolithic period, discusses the local and long-range relations of 'Ain Ghazal, certainly a major concentration of population, in order to pose questions about the nature of supposed 'regional centres'. Svend Helms discusses the use of stamp seals and incised signs on the handles of standardised jars in protohistoric Palestine and Transjordan and argues that they are evidence for economic complexity and centralised (political?) control. Robert Smith looks at trade in the life of Pella, concluding that it was not exceptional in quality or quantity, though nevertheless important. T.F. Potts focuses on a decorated ivory box from Late Bronze Age Pella, pointing out its very strong Egyptianising style and inferring that it represents an example of high-level socio-political exchange. Knauf and Lenzen publish their findings on Edomite copper-working in the Wadi Feinan.

In the same vein, but perhaps more concerned with communications and international relations, are papers by D. Homès-Fredericq on Phoenician artistic influence discernible in Iron Age Jordan, Gerrit van der Kooij on alphabetic writing in Iron Age Jordan, and Manfred Weippert on the Iron Age states in Jordan and their relations with the Assyrian Neo-Babylonian and Achaemenid empires. Pierre Bordreuil considers Ammonite and Moabite seals and epigraphy. Dennis Barry reviews the biblical view of the geography of Transjordan. Fawzi Zayadine examines the decorative stucco of Petra in relation to other sites of the period, while Andreas Schmidt-Colmet concentrates on the masons at Hegra in Saudi Arabia and their relations with the design of the Petra tombs. A different approach to the Petra monuments is taken by Judith Mackenzie who posits strong communications and parallel architecture development in order to allow the trends observed at Medain Saleh in Saudi Arabia as dating evidence. A. Almagro discusses the origins and repercussions, as far as the west end of the Mediterranean, of the architecture of the Ummayad palace in Amman. D.S. Richards writes about the Mamluke Barid, and shows how the Haram documents give evidence that the postal service included Jerusalem, and Rafat el Majali and Abdul Rahim Mas'ad review Mamluke trade and trade routes.

Alastair Killick considers Udruh and the Roman *limes* system in S. Jordan in relation to the trade route through the area. The road as a means of Christian pilgrim travel allows Jean-Baptiste Humbert and Michele Piccirillo to discuss topics of the Christian period. Thomas Schaub discusses the potential of thin-section analysis of pottery for recognising pottery as evidence for trade communications in Early Bronze Age Jordan, while Steve Falconer uses neutron activation analysis of the clay to investigate village pottery production and exchange in the context of a village between EBIV and MBII. Also on pottery there is a paper on the significance of Mycenean pottery on sites in Transjordan.

In the papers which are less clearly addressed to the theme of the conference one can perceive four kinds of approach. A few, a very few, seem to be a paper for the sake of a paper; some simply and usefully review the results of recently completed research, while others are only at the opening stages of their work and have early progress reports to give; others again have their own interesting themes to unfold. In the last category Don Henry examines transhumance patterns among recent Bedu and proposes a similar but different pattern for the epi-palaeolithic Hamran culture of S. Jordan. Gary Clarke and his colleagues

working on palaeolithic to early neolithic sites in Wadi Hasa set out in their paper to examine the relationship between site size and elevation and conclude that, contra Anthony Marks and Don Henry, the relationship is random and without change through time. Patrick McGovern proposes socio-economic transformation processes in aid of understanding the Late Bronze to Early Iron transition in central Jordan (and the Early to Middle Bronze period).

Among those who provide useful syntheses of research to date (and sometimes the field-work has reached its conclusion) are Alison Betts in the neolithic in E Jordan, Carie Gustavson-Gaube on the chalcolithic settlement of Tell esh-Shuna, Manfred Lindner on surveys in the region of Petra, and Stephen Hart on his Edom survey. Thomas Parker summarises a decade's work by many hands on the Roman *limes* in Jordan, emphasising the wealth of rich detail which is now added to the picture.

Books like this are going to remain useful on library shelves for a long time, but their utitlity is bound to be eroded year by year as the same authors publish at greater length or definitively elsewhere, and as the course of research moves on and simply renders many papers redundant. The conference and publication are undoubtedly doing their short-term job of raising the profile and the intensity of archaeological research and dialogue in Jordan: one wonders which two papers will still be consulted after a decade.

TREVOR WATKINS

HARRIS, David R. and **HILLMAN**, Gordon C. (eds) *Foraging and farming: the evolution of plant exploitation: [papers from the World Archaeological Congress held in Southampton, in 1986]*. London: Unwin Hyman, 1989. xxxiii, 733 pp; illus. (One world archaeology, 13) ISBN 0 04 4450257 Hbk: £50.00; pbk: £19.95

After the evolution of early hominids, food production is widely regarded as the second great discontinuity in the history of humanity. The origins of this discontinuity and the reasons for such changes have long occupied some of the ablest minds in several research fields. It is therefore no surprise that major and successful symposia on plant and animal exploitation were organised at the Southampton World Archaeological Conference in September 1986. It is a reflection of the increased pace of research and its consequent specialization that plants and animals are discussed in two separate volumes of the 'One World Archaeology' series; for a holistic science, this is unfortunate, though the scope of new research initiatives is impressive.

In view of the absence of a single volume presenting the detailed evidence for the origins of world plant food production since 1969 *(The domestication and exploitation of plants and animals)*, there is much to be said for the scope of this volume's coverage. Twenty years on, the explosion of new discoveries takes in regions—sometimes continents (such as Australasia)—hardly mentioned in 1969. The extreme bias of the class of '69 towards Europe and the Near East has been replaced by strong coverage of the Americas (12 chapters), the Far East (10), and Australasia (7). The Eurasian rump (Europe (3) and the Near East (6)) is slimmer, yet coverage of Africa (4 chapters) is still small. This new diversity reflects a change in theoretical approach as much as a methodological revolution. The majority of practitioners now accept the Higgsian doctrine that food production cannot be explained without a clear understanding of previous strategies of wild plant usage set in a broad regional context; no-one can pretend to a serious contribution to agricultural origins by presuming to find the earliest domestic broad bean. The implication is a concentration on ethnoarchaeological research, whose practice is often most rewarding in areas of traditional wild

plant exploitation. This 'new wave' is reflected in the institutional credentials of the participants—an increase of over 250% in anthropologists and environmental scientists over 1969. The payoff in research advances is dramatic; many of the 45 chapters make exciting reading. A third major change is the range of crops now studied—a preference for seed crops over root crops in 1969 is now reversed, with far more quality, innovative work now appearing on root usage.

The work is divided into five sections, which follow a preface by Peter Ucko who sets the volume in its WAC context. Four chapters set the theoretical scene in Part 1; there are 7 chapters on non-agricultural, 8 on pre- and 13 on agricultural economies (Parts 2–4), while the fifth part comprises 13 chapters which examine the evolution of regional agricultural systems. The overlap between Part 4 *(the domestication and diffusion of crops and assemblages)* and Part 5 is perhaps unavoidable.

Of the many papers with strong methodological components, several authors introduce innovative techniques. Hills and Evans discuss methods of analyzing organic residues in ceramics, Pickersgill touches on DNA analysis of ancient maizes and Chikwendu and Okezie present early results of an experimental programme of wild yam cultivation. Stahl's paper on chemical ecology explores the effects of plant-food processing on diet, taking debate further than Dean Arnold's ceramic studies and drawing significant conclusions.

Much of the information in this volume is significant to specific times or areas. In the context of Palaeolithic plant exploitation, Papua New Guinea still stands out as a region with very early (c. 40th BP) evidence for environmental manipulation of food-plants but rather generalist forest management, as Groube points out. The drainage ditches of Kuk (PNG) continue to stimulate the search for early analogies; but the Eastern Highland terraces cited by Golson as parallels remain stubbornly undated. After the false start of the Wadi Kubanniya wild barley, the evidence Hillman presents for root crops in the 16th MBC in Egypt is more convincing; broad-spectrum revolution 8 millennia before Binford's predicted date is in line with other Late or Epi-Palaeolithic data (Abu Hureyra, Kajale, etc). A recent explosion of archaeological excavations in China, sumamrized by Chang and Zhimin, has yielded 7th MBC dates for millet domestication and 6th MBC dates for growing of rice. There is still no consensus about the independence or otherwise of maize cultivation and domestication in the Andean, Mexican or Panamanian centres, though cultivated maize is known in each area by the 6th MBC. For Panama, Piperno demonstrates that major settlement nucleation and intensification postdate initial cultivation by as much as 4 millennia; her theory of economic reciprocity increasing the subsistence reliability of both foragers and farmers is important in wider contexts (cf. Zvelebil & Rowly-Conwy's 'availability' model for Europe). In the domain of specifics, Europeanists will find this volume thin, the chapter on the Uzzo plant remains notwithstanding. Much of the archaeology in Starkey's chapter on Indo-European agriculture is outdated and it is doubtful whether the origins of PIE will ever be illuminated by dating the first intensive use of the apple.

To those contributors content with little more than a summary of often valuable empirical work on a crop or a region, Sanoja (p. 525) poses an important challenge in his view that, for many, the development of agriculture seems 'little more than a history of cultivated plants, instead of a history of human labour'. To the generalist reviewer, the success or failure of this volume turns on the relationships posited between social structure and the empirical detail of changing economic strategies. In a major, multi-author work, anything but a lack of theoretical consensus would be surprising. The strongest contrasts are found in Part 1, with Rindos eschewing social action in favour of Darwinian selection, Chase

adopting a Giddensian perspective of social action and the active symbolic manipulation of wild and domestic species and Harris providing an elegant, if asocial, classification of types of plant exploitation on an increasing scale of energy investment, from wild plant procurement to agricultural systems. A sign of the passing of processual archaeology is that the role of prime movers (climatic change and population pressure) is usually minimised (but see Bar-Yosef and Kislev); more typical is Watson's hesitation in assigning causes of complex change in N. American foraging societies. Shipek provides as interesting glimpse of the role of ritual specialists (shamen) in California—an instance of forager ethnobotany as empirical science (*pace* Childe). And Higham and Maloney focus on the domestication of humans rather than plants in the process of increased sedentism in Thailand. But it is Sanoja, again, who provides insights into the social significance of sedentism, which he characterizes as a constant and collective, rather than an individual and intermittent, appropriation of natural resources by villagers with a re-structuring of the work force because of accompanying technological changes. The implications of this change for specific crops or plant associations often await detailed investigation.

So—what of agricultural origins? In a post-processualist world, few contributors feel the need to build a global, general explanatory model. In a real sense, this volume records archaeobotany's loss of processualist innocence. Here, specifics outweigh grand hypotheses and the conclusion is that, because of (rather than despite) wider coverage of the problem, integration of regional solutions into a one-world theory of plant domestication is but a gleam in the eye.

This volume sharpens our appreciation of future problems of research into plant exploitation worldwide. It would be prudent to remember Moore's warning that, even in the Near East, our knowledge of local vegetation in the pre-agricultural period is insufficient for understanding of local land-use strategies. Although technical problems in distinguishing wild from domestic plant remains are largely played down, such problems still cause concern (e.g. the vine and the olive, poorly covered in this volume). The greatest challenge is to define the social as well as the geographical contexts for changes in plant usage; the reasons for early sedentism and Palaeolithic intensification are rarely discussed in detail in this volume (but see Yen and Smith). In this sense, the most hopeful sign for future work in this research field is the inclusion of social anthropologists as collaborators on a broad front.

In summary, Harris and Hillman's volume on early plant exploitation marks a turning point in studies of agricultural origins on a world scale. It will remain essential reading for a generation of scholars, no doubt aided by its attractive production and reasonable price. Certainly, in this volume, the aim of the Southampton Congress to portray the rich, varied scholarship of one world has not been frustrated.

JOHN CHAPMAN

HART, Gerald D. (ed.). *Disease in ancient man: an international symposium [held in London in 1979]*. Toronto: Clark Irwin, 1983. xvii, 297 pp; illus. Can$ 29.95

This volume consists of papers delivered at the International Symposium on Disease in Ancient Man held in London in 1979. Much of the program was organised by and dedicated to Calvin Wells, and is a tribute to the range of his interests and contacts bringing together archaeologists, physical anthropologists and medical specialists. Despite the absence of palaeopathologists dealing with hominid remains and New World populations there are a number of valuable contributions on disease in later human populations, notably

Møller-Christensen on leprosy and Hackett on syphilis and yaws, as well as a cautionary note on post-depositional pseudopathology by Perrot. Møller-Christensen's photo and note on a 1450 AD Danish leprosy case with calcified cysts of echinicoccus is important evidence of this parasite, but the calcification is not necessarily directly related to leprosy, as calcified helminth cysts and ova occur in ancient and modern cases of dracunculiasis and schistosomiasis where leprosy is not involved, following the death of a parasite.

A wide range of techniques of physical analysis were used by contributors, and quantative analyses of levels of lead in bones from Iron Age to medieval British populations are given in papers by Cramp and Waldron. A number of papers were contributed by the interdisciplinary team which analysed the mummy of Nakht, a 12th century BC adolescent Egyptian weaver with schistosomiasis whose remains are now in the Museum of the Academy of Medicine, Toronto. Millet suggests that the XRF analysis indicating granite dust in Nakht's lung could be evidence of a stint of penal labour hammering granite statues. Statistical studies of recent autopsies of schistosomiasis show that cirrhosis of the liver, which Nakht apparently also suffered from, is unrelated to schistosome infections. Was Nakht an early case of conviction following adolescent alcohol abuse?

R.L. MILLER

HERRMANN, Georgina. *Ivories from room $_{SW}$37, Fort Shalmaneser. Vol. 1: commentary and catalogue; Vol. 2: plates.* London: British School of Archaeology in Iraq (Gertrude Bell memorial), 1986. 2 vols (1 of plates). (Ivories from Nimrud (1949–1963), fsc. IV). £100.00

Herrmann sets an entirely new standard for the publication of ivories with this latest fascicule in the *Ivories from Nimrud* series, all the more admirable given the relative speed with which it was prepared. Her commentary is lucid and succinct, skilfully guiding the reader—even the comparative novice—through this enormous collection from $_{SW}$37, with over 1500 catalogued entries. These detailed descriptions, taken with exhaustive photographic record, should easily meet the requirements of specialists.

Ch. 2 summarizes the principal sections of the catalogue, with objects grouped by form/function (panels, pyxides, plaques) and the panels—comprising the largest section—subdivided according to subject matter and technique (cloisonné, champ-levé). Within this framework, Herrmann isolates many 'sets' and builds up workshop groups with distinctive features ('triple flower', 'beaky nose', 'round-cheeked and ringletted'). Where stylistic traits are common to several groups, Herrmann is able to posit larger 'schools' of carving which in turn may be assigned to broader 'traditions' (Ch. 6). Here Herrmann departs from conventional terminology, eschewing specific ethnographic designations (North Syrian, Phoenician) for more neutral terms: northern, southern and intermediate traditions (the latter covering Winter's South Syrian category).

Hermman has less success in pinpointing actual production centres but there archaeological evidence is against her. Captive artisans working at Nimrud no longer seem credible; all evidence points to manufacture in wealthy city-states of Syro-Palestine—Hamath and Samaria among them. Dating the output of workshops is a related problem, highlighted by Herrmann's valuable survey of comparanda (Ch. 3). Production must have started in the 9th century —perhaps earlier at some centres—and continued through the first half of the 8th century Certainly ivories comparable to those from $_{SW}$37 were in use at Hamath, and, especially, at Samaria when these sites were destroyed by Sargon in 720. Thus the $_{SW}$37 collection could represent a single consignment of plunder from that Syrian campaign (p. 53).

If Herrmann is right, it may also help to explain that intriguing 'fruit-cake'mixture in $_{sw}37$, with the ivory-clad furniture smashed and scattered haphazardly through the fill, yet carefully stripped of its gold overlays. While some pieces would have been selected for use (hence parallels in the Burnt and North West Palaces), most were stripped and stored (p. 53). Perhaps some furniture was partially dismantled, its condition deteriorating with time, so that by 614/12 the contents of $_{sw}37$ would have held little attraction for looters, save as the objects of wanton destruction.

Contributions by Kitchen (Ch. 4: 'Egyptianising' ivories), Millard (Ch. 5: Fitters' marks) and a series of appendices are much less speculative, as is Herrmann's useful chapter on 'Tools and Techniques'. Her remarks on the 'grain' of ivory are, however, somewhat confusing: flat panels and plaques are surely not cut 'across the grain' i.e. (transversely), but with it (longitudinally) since, as she says, the 'growth rings' can be seen in section (p. 56).

The glory of Ivories from Nimrud, IV lies in its plates and the photographers deserve much praise. Ivory, a notoriously fickle subject, here is handled with such sympathy that one can almost feel the objects (shown at 1:1). The black ground is particularly felicitous since this highlights internal details, whether stylistic or technical. Exceptionally clear too are tool marks on the undersides—scoring, random scratching, gouging—as are the various types of mortises. This decision to illustrate all backs which display significant features is exemplary and conceivably unparalleled. With study of archaeological material subject to potential vagaries of access and to perennial constraints of time and expense, such a thorough scheme of publication should serve as a model for other teams.

O.H. KRZYSZKOWSKA

HODDER, Ian (ed.) *Archaeology as long-term history*. Cambridge: Cambridge University Press, 1987. vii, 145 pp; illus. (New directions in archaeology) £25.00

In the preface of this book it is pointed out that in the phase of processual archaeology, the historic dimension had greatly disappeared, but now the links bewteen the two disciplines of the past are being reinstated. Towards that the present book is aimed to play a role. Not only can archaeology offer its long time span, but also it contributes to the discussion of methods and philosophy of history.

The book contains eleven chapters arranged into four sections, on a conceptual basis laid out by Hodder in the introductory paper. There he attempts to analyse the problem of historical approaches in archaeology. Hodder then describes the ideas of Braudel and the Annales School in Paris, dividing historical processes into three scales which are then used as a conceptual framework for the remaining papers in the book: 1) the very long term; with 'permanent slow-moving or recurrent features'; 2) 'structural or social history ... of groups, collective destinies and general trends'; and 3) 'the individual and the event'.

In his paper 'Art history, archaeology and idealism', James Whitley demonstrates how the conventional view of German archaeology as solely being obsessed with descriptions of artifacts is wrong. Although there is a lack of social or anthropological approaches as in Anglo-American archaeology, German archaeology has stronger relations to art history, aesthetics and philosophy, concentrating on 'idealism' in particular, avoiding becoming 'second-class sociology of the past'.

The second section deals with 'the very long term'. Knut Helskog observes rock carvings from the Late Stone Age (c. 4200–500 BC) in Arctic Norway and compares them to depictions on sami drums used by shamans in medieval Norway. The resemblance of the figures and the common selectivity of what was depicted indicate continuation of a tradition over a very long period of time.

In chapter four, von Gernet and Timmins also attempt to demonstrate cultural continuity, using a find of parakeet bones, pipe and other artifacts in a pit on an Iroquian site in Ontario dated to early second millenium AD. This find is related to ethnographic and historical evidence which illustrate the context of pipes and birds as having a meaning. This meaning of the context of these artifacts can therefore be found by 'controlled use of analogy', with a historical dimension which makes cross-cultural analogy more acceptable if evidence or implications for common ancestry can be traced.

In the third section of the book, 'Continuity and change: the past active in the present', Jacqueline Nowakowski's interesting observation on a modern farming community in Bodmin Moor gives us an insight into people's views on material remains from the past. She demonstrates how perceived values concerning material culture from the past can influence and restrict behaviour in the present. Paul Lane observes the village life of the Dogon of Mali in West Africa, and shows how history is politically active and knowledge of the past is continually used to maintain and reproduce the structure of social domain.

Elisabeth Vestergaard writes the shortest but one of the most interesting papers in the book. She compares two thirteenth century texts which relate a similar story of the same characters and events from the age of the great migration of Europe. The two texts, the Scandinavian Völsunga cycle and the German Nibelungenlied are believed to have a common origin, but developed independently. By comparing the texts Vestergaard claims to show how the narration reflects contemporary milieu, underlining the 'meaning' of artifacts and how this meaning can vary in different social and cultural settings.

By observing the contents of the Völsunga cycle and the Niebelungenlied, with special attenion to material culture, Vestergaard discovers striking differences. In the Völsunga cycle there are modest descriptions of material culture, while in the Niebelungenlied it is overreaching and often greatly exaggerated. While Vestergaard concludes that this reflects the difference in values and meanings of diverse societies, she leaves out the controversy over the transformation of the texts, and oversimplifies the matter by narrowing it down to the cause being the differences in the two societies. Although it may be argued that the difference simply reflects individual style of narrating a story, Vestergaard's reasoning and interpretation remains convincing.

In a paper on 'shifting cultivators' of the Rajmahal Hills in northeast India, Ajay Pratap very convincingly demonstrates by applying a historical approach how general categories can be misleading. Rather than being a model of neolithic 'shifting cultivators', the economy of the Savariyn society is structured by circumstances retained by colonial intervention and money-lenders.

The last section of the book deals with the concepts of acculturation, diffusion and migration in a new perspective, showing how such processes are affected by the social or symbolic meaning of material culture. As does Pratap, Henrietta Moore shows the inadequacy of general laws. The processes of social change such as 'westernisation', or 'Europeanisation' are not known, and generalisations do not help to gain that knowledge. In her study of the Marakwet of Kenya, Moore demonstrates the complexity of these processes, with special attention to the continuity of some prevailing ideas through massive alteration, and also the reverse, i.e. changing of ideas to maintain prevailing conditions.

David Collet observes the appearance of migration in the archaeological record, by tracing the history of the Ngoni and Kololo migration in south Africa. While pottery style was maintained, spatial organisation of the homestead was altered according to the 'ideas' of the dominating newcomers, emphasising the 'continuity through change'. In his paper on gothic material culture, Kevin Greene observes gothic eagle brooches arguing that

'abstract concepts about society were displayed by decorated metalwork', and illustrates by historical research how such 'meanings' can be derived from archaeological data.

Some of the papers in the book (Whitley and Vestergaard in particular) were too concise to be fully enjoyed and barely comprehensible without previous knowledge of the topics. Therefore, they serve more for the general aim of the book, rather than as to illustrate the particular subject matters. On the other hand, some of the other papers are in fact long reports of projects, slightly peppered with contextual archaeology.

Despite an intention to materialise archaeological theory, there is little archaeological data in this book. However, it serves to change the archaeologist's attitude to the evidence, and essentially add a historical dimension to archaeological explanation. That will cause the endeavours of general laws to come crashing to the ground, for although groups or societies may appear similar, their history will be of multifarious variation.

The greatest value of this book is coherent with its aim, to reinforce the links between archaeology and history, the two disciplines dealing with the past. It shows how shallow and insufficient an approach can be in reconstructing the past, if the historical dimension is ignored. Although there is cultural continuity over very long term, there is also the individual and the particular event in the history of groups and societies.

ADOLF FRIDRIKSSON

HODDER, Ian (ed.) *The archaeology of contextual meanings*. Cambridge: Cambridge University Press, 1987. 112 pp; illus. (New directions in archaeology) £25.00

In reply to its critics, contextual archaeolgists have attempted in this volume, to show that 'it can be done'. What is 'it'? In his introductory chapter, Hodder reminds us. The archaeological record should be analysed in terms of contexts, which requires firstly, identifying networks of patterned associations between objects, and secondly, interpreting what such patterns mean. This meaning is constituted in three ways: through (i) function (ie. matter, energy and information exchange; (ii) structure (ie. code or text); (iii) content (particular historical element). Interpretation in contextual archaeology encapsulates all three of these semantic components, since it is claimed that they form the three relevant dimensions of any archaeological context. Hodder goes on to explain several key concepts employed in contextual analysis, and then also reminds us of some of the inherent difficulties, predominantly the problematic nature of defining contexts; the chief assumption, made explicit, is that cultural order has a universal base or 'grammar' which enables people of different cultures to understand one another, and consequently for the archaeologist to understand the archaeological record.

After Hodder's useful guide through the intricacies of contextual analysis, we are presented with several examples, which are arranged under three sections: contemporary, historical and prehistoric archaeological studies.

The three papers under the first section of contemporary studies deal with very varied contexts. Hodder's 'Bow ties and pet foods: material culture and the negotiation of change in British industry' looks at the relation between the symbolism of bow ties as worn by the management of a pet food company, and the business ethic of equality for all members of a large 'family' which constitute the employees of this company. In 'Iconography, sacred and secular: visions of the family', Sheena Crawford examines the connection between sacred icons and secular photographs in Cyrpus; both relate to an ideal, namely that of the Heavenly and Earthly family respectively, the latter being a representative of the former

through the mediation of the women. Sarah William's study, 'An 'archaelogy' of Turkana beads' attempts to answer the question of how history and economics affect an ideologically defined group, by looking at the symbolism of beads among the Turkana of Kenya.

The next three articles come under the section of historical studies. 'All styles are good save the tiresome kind. An examination of stylistic changes occuring among silver candlesticks of the eighteenth century (1680–1780)', by Tony Sinclair aims to analyse the stylistic change in silver candlesticks during the eighteenth century for an underlying pattern, and discovers that such variation seems to refer to aesthetic ideals of the period which are manifest in other areas, and also to the taste of the tastes of the individual manufacturers. Robert Jameson's 'Purity and power at the Victorian dinner party' discusses various rules of etiquette in the nineteenth century taken from contemporary manuals, and how the dinner party actually creates, rather than reflects the ideals given in the manuals. In 'Material metaphor, social interaction and symbolism in the Igbo-Ukwu corpus', Keith Ray examines metal objects of the Igbo-Ukwu of Nigeria with the help of ethnographic and iconographic studies to highlight patterns that would not normally be visible because of their particular historical nature.

The final five papers are prehistoric studies. 'Identifying gender representation in the archaeological record: a contextual study' by Liv Gibbs, is an attempt to make inferences about gender roles and relations from patterns present in the material culture of North East Zealand in Denmark between the mesolithic and bronze age. In 'Material order and cultural classification : the role of bronze objects in the transition from Bronze age to Iron age in Scandinavia', Maria Louise Stig Sørenson stresses an active, rather passive role for material culture in change generated by the internal logic of contextual associations. Linda Therkorn's 'The inter-relationships of materials and meanings: some suggestions on housing concerns within Iron age Noord-Holland', aims to define various social practices by an analysis of the spatial patterning in the houses, with respect to earlier and later types and also to a wider geographical region. 'Value and motivation in prehistory: the evidence for 'Celtic spirit'', by Nick Merriman, looks at the concept of the Celtic spirit in terms of its history in our culture and thereby questions its validity. Finally, 'Flying stags: icons and power in Thracian art' by Tim Taylor, is an effort to reintroduce art history into archaeology through a study of the iconography of Getic objects from fourth century BC burials in Romania, showing the historical specificity of the styles as distinct from the social strategies they are set within.

The fairest way to judge a book is by reference to its aim. The aim of this book was essentially to provide examples of the interpretation of contextual menaings, and indeed this is what we get. However, one could easily be forgiven for not realising, until late in the day, that it has anything to do with archaeology. Only one out of three sections, and five out of eleven papers, is devoted to explicit archaeological studies. Now although all the examples deal with the relation between material culture and meaning, less than half are concerned with material culture in an archaeological situation. There is an important difference between material culture in contemporary and historical settings and an archaeological one which seems to have been ignored; namely, that in the former two, the meanings associated with the material culture are directly accessible through the words and actions of the people in question. This is not the case with the latter, and it is precisely this problem which archaeology has always faced, and upon which the contemporary and historical studies engender a sense of déjà vu or nothing new (there is one exception—Merriman's study of the Celtic spirit, which I regard as by far the most illuminating paper in the collection)—the meanings 'extracted' from the material culture in an archaeological situation rely, as always, either

on analogy or the 'common sense' of the archaeologist.

GAVIN LUCAS

HODGES, Henry. *Artifacts: an introduction to early materials and technology*. 3rd edition. London: Duckworth, 1989. 251 pp; 51 figs. (Paperduck) £9.95

The long awaited third edition of Henry Hodges' *Artifacts* must prove to be something of a disappointment. Although described as the third edition, it should more accurately be called a revised reprint of the second edition. Hodges himself admits as much in the addition to the Preface: 'For this third edition the same text has been reproduced as in the last with two addenda to the Bibliography.'

However, in many ways this re-issue is a tribute to the enduring value of Henry Hodges' work. In spite of thirteen years having elapsed since the second edition, it is still a vital textbook heavily used by student and research worker alike. It is perhaps also a tribute to the breadth and diversity of his scholarship that no junior colleague has been found who could have helped incorporate into a true third edition the results of the last decade of research. We must also rejoice in its publication as a relatively inexpensive paperback. This means that the book will be well within the pocket of students who will surely be delighted that it is in print again.

BRENDA M. COOK

HODGES, Richard. *Primitive and peasant markets*. London: Blackwell, 1988. xiv, 175 pp; illus. (New perspectives on the past) Hbk: £22.50; pbk: £7.95

Rarely can the thesis of a book, that 'we need the benefit of long-run, wide-angle vision—of an anthropological vision—to avert catastrophes of our own making' (p. 155) have been more clearly illustrated than in the recent sorry destruction of rain-forest. This book, however, is about peasants, not tribesmen or women, but the message is the same, and has been since the time of Tacitus.

What does the author say, and does he succeed in saying it? His aim is clear from the start: 'It behoves us now, with a great array of scientific data at our disposal, to understand the space time dynamics of our global history so that at any one point in time in the future, we shall not be induced to make short-term, expedient decisions' preface, p. xi). This is optimistic stuff: reasoned argument will show us not where we went wrong, but the diversity of human experience with which we must come to terms if we are to achieve an equitable and balanced world economy.

Compared with Dr. Hodges' first book, *Dark Age Economics* (1982), there is less archaeological material, proportionately more geographic, economic, numismatic, ethnographic. His approach is still substantivist: modern economic theory is inappropriate to the study of the 'primitive'. But there is a significant shift in 'downgrading' the archaeological content: one of the criticisms levelled at Dr. Hodges first book was whether one could deduce anything meaningful about past 'economies' from excavated material. Now the archaeological material is more clearly separated from the anthropological.

The prime assumption is still, however, that there were economies, that there were markets (n.b. plural), and that we can both recognise and classify them. It is perhaps possible also to understand a little of how they functioned, and to begin to understand the role of coinage in emerging statehooods and their market-systems. Clearly the selection of material to illustrate these themes is a personal matter: most of the material comes from the period which forms the European Middle Ages. There are some good choices of material (such as the

distribution of English pottery as shown by Streeten), but also some surprising omissions in this field (such as the valuable work of Vince or Moorhouse).

Nevertheless, this book should prove a useful quarry for economic and social historians, and archaeologists who wish to find arguments neatly summarised for their own use; classical archaeologists in particular might find much of interest. Some readers will undoubtedly take issue on either factual or stylistic grounds. There are good definitions and examples of markets, but the author carefully avoids stating what, on archaeological grounds, one might recognise as a peasant. Again, though reference is made (p. 125) to the 'little tradition' of Robert Redfield, this key section—especially pp. 142ff—does not have the appropriate entry under Redfield in the bibliography. Also, statements such as '... the church farm of Herjolfsnes 0111 in the extreme south-west acted as a dendritic central-place, while the episcopal manor at Gardar 047 was the colony's central-place' (p. 142) would make easier reading if the author had been permitted a map. Indeed, this is the one real problem with a book such as this, which is, on the whole, easy reading: there are only a dozen illustrations in all. The author must have felt severely constricted in this by the publisher. But then, in a book which embraces medieval Greenland and Late Imperial China, you can not have everything.

The author succeeds in putting his message across, in condensing a body of widely disparate material into the unshakeable conviction that 'it is not appropriate to tell these people to assimilate western history—to change' (p. 153). Whether this book will reach open-minded people in the right quarters is beyond the author's control. Meanwhile—read it, and make up your own mind.

RAPHAEL M.J. ISSERLIN

HOLGATE, Robin. *Neolithic settlement of the Thames basin*. Oxford: British Archaeological Reports, 1988. xiii, 392 pp. (BAR British Series, 194) £24.00

This work is part of the general renaissance in studies of British Neolithic lithics which aims to return flint and stone tools to the central place in British prehistory they once occupied. The belated return to favour of such analyses has come because of the recognition that much of the evidence for the settlements of earlier prehistoric Britain now lies in the ploughsoil and in museum stores across the country.

Holgate's book is a study of the Later Mesolithic and Neolithic flint scatters of the Thames Basin. The three preliminary tasks of such a work must be to convince the reader that his selection of study area is correct; to demonstrate that flint scatters do in fact represent remnant settlements; and to deal with the potential biases in the record. The first is glossed over with the statement that the Wessex Basin contains a variety of landscape types, which is true, but hardly adequate. The second is dealt with at greater length, with the identification as domestic sites those flint scatters which had a high ratio of implements to debitage and a wide variety of implements. Such a conclusion seems eminently reasonable, and Holgate divdes his sites accordingly.

Having accepted this point, one naturally needs to be sure how far the evidence collected is typical of the settlements in the region. The most important difficulty here is the increasing number of neolithic settlement sites which have been discovered under alluvial or colluvial deposits. These are, of course, protected from destruction through ploughing and therefore will not show up as flint scatters. There is a very real possibility that such sites, close to water sources, were the most important settlements of prehistoric Wessex: this would radically affect Holgate's conclusions, which are based on the flint scatters.

The result of Holgate's labours is a valuable compendium of little-known material, usefully presented in a series of tables containing a breakdown of the collections from each site. However, having assembled the evidence, Holgate's treatment of it is less satisfactory. The data under study are placed in one of three chronological periods—the Later Mesolithic, Earlier Neolithic and Later Neolithic—but the problem of separating Later Neolithic from Earlier Bronze Age flintwork is not discussed. Many other workers examining surface material have treated the two as a single unit because of the difficulties of distinguishing between them. Holgate identifies an expansion of the settled landscape during the Later Neolithic, but can we really be sure that it is not largely a Bronze Age phenomenon?

An important question which Holgate should have been able to examine is the possible existence of a site hierarchy. Causewayed enclosures have recently been seen as developing into major defended settlements by the end of the Earlier Neolithic and acquiring surrounding territories of dependent villages. Although the enclosures are known, and in many cases excavated, the smaller domestic sites around them are available only as surface scatters. Also relevant to this issue must be the large spreads of flintwork adjacent to causewayed camps, only one of which has ever been excavated. Even if the data are inadequate for detailed treatment, it must have been possible to give a preliminary assessment, if only whether or not the sites outside the enclosures are contemporary with the occupation inside. Despite these shortcomings, the great value of Holgate's work is that questions such as this can now be addressed on the basis of the evidence from the flint scatters.

I.J. THORPE

HUNTER-ANDERSON, R.L. *Prehistoric adaptation in the American Southwest.* Cambridge: Cambridge University Press, 1986. xiv, 143 pp; 16 figs; 12 tables. (New studies in archaeology) £22.00

Dr. Hunter-Anderson concentrates on post-Pleistocene aboriginal adaptive change in the mountainous Reserve area of west central New Mexico and the arid, flat Upper Little Colorado area of east central Arizona. She offers a natural science alternative, an evolutionary model, to the prevailng culture history paradigm used to explain the shift from hunter-gatherer economy to agriculture. Hunter-Anderson's approach, which owes an intellectual debt to Lewis Binford, is to propose a model that is density dependent; human responses are conditioned by high-human population density and its effects.

Dr. Hunter-Anderson makes use of a wealth of archaeological material and ethnographic data, as well as calling upon propositions empirically established by other disciplines, to support her model. Her approach to the problem of assigning anthropological meaning to archaeological data is a potentially productive alternative to other current approaches within the New Archaeology.

However, this is a very specialist work and not one that the archaeological novice will find easy going. Bearing in mind that the advertised aim of the series is to make available to a wider audience the results of new developments in the field, this particular contribution tends to shoot over the heads of that wider audience. I felt, also, that Hunter-Anderson expended more space in trying to justify her approach than was really necessary. In any event, the reader must judge whether or not Hunter-Anderson's ecologically oriented model for adaptation and adaptive change is a viable one. My own view is that her work has come some way to increasing the scientific knowledge of aboriginal adaptations in the southwestern United States in particular and in pointing the way to increasing our understanding of the mechanisms involved in aboriginal adaptations in general.

J. MICHAEL HOADLEY

HURST, H.R. *Gloucester, the Roman and later defences: excavations on the E. Defences and a reassessment of the defensive sequence;* with the research assistance of L. F. Potts. Gloucester: Gloucester Archaeological Pubs., 1986. ix, 150 pp.; illus. (figs & maps). (Gloucester archaeological reports, vol. 2) £17.95

After an introductory section, the report deals with a necessarily brief series of operations on the site (and yards) of six frontage properties investigated in order to get a controlled sequence of activities over the presumed eastern course of the Roman town wall and its ditches. The occasion is used to reassess old excavations and to incorporate information derived from several watching briefs. All this information is then used to arrive at a definition for the defences in the Roman and post-Roman periods. A series of conclusions, such as the post-Roman topography of the defended circuit, complete the work.

This report is a major statement for provincial urban archaeology. The fact that a major cartographic statement concerning the wall and its ditches can be made from the legionary beginnings of perhaps AD 65 to the thirteenth century (Fig. 5) is justification enough for this work, even without the luxury of an actual discussion of the structural and stratigraphic sequences' import (Chs 4–5) that is in fact not luxury at all but the logical outcome of all this labour. This, then, is rather more than just the conventional excavation report that constitutes Chapter 2. The work is designed to permit reassessment: both the site text and the pottery report by Dr Timby include remarks on the basis for the chronology, and the usefulness (or otherwise) of the pottery for dating purposes. There is an understandable period bias in this report; even though the post-medieval pottery is treated in some detail, the stratigraphy is not particularly notable and thus gets summary treatment. Some readers may find it hard to get used to the large amount of (archival) text used to describe the stratigraphic sequence but without a commensurate amount of separate illustrations to show in detail what is being discussed, this forms a contrast to the copious illustration in Dr Hurst's report on the Carthage defences. It is however difficult to put in overmuch detail, especially when the excavated area reveals not much structural material, requiring detailed illustration, so the concentration on the more essential points was probably the right editorial decision to take.

Much work has gone into the redefinition and recalibration of the periods of Roman wall construction, viz., the late 60's AD; early 2nd century; late 2nd century; and two sets of activity of the late 3rd–4th centuries, based not on documentary but solely archaeological grounds. This leads to at least one interesting conclusion, namely that the first city wall, built of *opus quadratum* may well be the work of Leg. XX, which was also responsible for constructing a similar style of wall in Chester when it was based there (p. 119). Also notable is that the work of the 60's AD, the early legionary rampart, so frequently found slighted on other sites after military withdrawal, was here retained to be incorporated into later work: an unexpected feature which should act as a caution to other excavators on sites elsewhere.

This is a good report, as an example of local archaeology being integrated into a discussion of material from within the Province, and given an international dimension when appropriate. It permits assessment, and, equally important for future researches, reassessment. But Dr Hurst's work should stand the test of future excavation for long. Now that the limits of the Roman town have been so ably demonstrated, we await with interest the publication of work on its interior.

R. M. J. ISSERLIN

JOHNSTONE, Paul. *The sea-craft of prehistory*. 2nd edition; prepared for publication and with a new foreword by Seán McGrail. London: Routledge, 1988. 260 pp; illus. £14.95

This remains one of the best books, perhaps *the* best book, about nautical archaeology and early boats. As judiciously edited by Seán McGrail for the first (posthumous) edition, it is a mine of information and examples, ranging over the whole world and from earliest times even up to the present where necessary. The generous supply of illustrations (well chosen by the editor) enable the book to stand on its own, while there is ample documentation in the notes. Throughout, the text is illuminated by Johnstone's humane, lively, sometimes sceptical vision, the product of his scholarship, seafaring experience and mastery of film and TV. It remains a personal statement; diffusion gets a better look-in than some would allow, and typology is for the most part made to serve rather than to dominate the general flow. Nonetheless, it is a fascinating and inspiring overview, which no student of archaeology should fail to read. The updated paperback edition makes no substantial changes to the main text, while providing a modest but useful list of recent publications in the foreword; it is good value.

A.J.PARKER

KEATINGE, Richard W. (ed.) *Peruvian prehistory: an overview of pre-Inca and Inca society*. Cambridge: Cambridge University Press, 1988. xvii, 364 pp; illus. Hbk: £35.00; pbk: £13.50

Ten papers review specific periods of Peruvian history in which their different authors have a particular interest and expertise. This results in a collection of separate papers with no cross references, some overlap and occasional contradictions. But the book is unified by the chronological ordering of the contributions and a final synthesis in which Richard Keatinge summarises the major ideas presented, examines current trends in Peruvian archaeology and suggests possible areas for future research.

The use of modern national frontiers often imposes misleading boundaries on peoples of the past, but perhaps it was the Peruvian focus of the book that prompted the inclusion of Raymond's essential paper on the eastern slopes of the Andes and tropical forest emphasising how the resources and cultures of this region have always played an important part in the life of Andean people from the introduction of the earliest cultigens to more recent exploitation of gas and petrol.

The framework for the volume is provided by the long standing chronological scheme which divides Andean prehistory into a number of different periods; three Horizons, each typified by a wave of stylistic influences that cover vast territories, and intermediate periods when more localised regional styles developed. Although it is this scheme that structures the contributions to the book, the volume as a whole provides many reasons for re-assessing what it tells us about the past, and whether its imposition does not in fact obscure our understanding. All the authors discussing the three Horizon periods emphasise great regional variation in the way in which the Horizon style is manifest and highlight regions in which it is not recognised. Richard Burger's paper explains the ambiguity resulting from the use of different stylistic elements to define the Chavin horizon, and the problems of using a chronological scheme originally developed on the south coast in the analysis of sites in the northern highlands. The volume includes information from several large scale regional surveys, some of which are published here for the first time, and many of the papers emphasise the need for more detailed regional studies and the construction of local chronologies fixed by absolute dates, to allow a more balanced study of cross regional styles and their significance. Similarly the first two chapters, looking at preceramic evidence, condemn the egocentric search for 'The earliest site' and the confused creation of universal evolutionary sequences for describing stone tool technology, favouring instead

attempts to understand more localised subsistence strategies—although the evidence is not sufficient to support Rick's hypothetical seasonal patterns based on probable resource availability.

Perhaps because of problems in defining elusive styles most authors placed their emphasis on analysing settlement patterns, irrigation systems, and differing scales of public architecture, thus giving some of the papers a greater vitality than many previous studies of Peru's past which have placed an excessive emphasis on pottery and its decoration. It is unfortunate however that there were not more site and regional plans to accompany the very useful maps of Peru at the beginning of each paper, more illustrations would have made it very much easier to visualise such spatial patterns. Especially in papers like Pineda's which 'examines developments in social organization and their economic basis, as reflected in the architecture and its patterns', or Conklin and Moseley's paper looking at 'Patterns of art and power in the Early Intermediate Period', where the presence or absence of organised power is thought to be shown by the presence or absence of large scale construction projects, and the size of the area covered by such projects is assumed to be comparable to the size of the area over which that power had control.

The inferred religious character and effect of politico-religious systems is discussed by many authors; Pineda's paper on the Late Preceramic and Initial Period suggests the 'establishment of a power structure which grew in strength alongside the religious organisation connected to the pyramid-temples', and she sees this as the point of departure for the process of social differentiation on which later civilisations of the Andes rested 'based on the economic power of a minority: the priesthood. In the name of the gods which own members created and qualified as part of a powerfully repressive apparatus, the minority gained control of the labour force, thereby disposing of sufficient manpower to achieve increasingly grandiose public buildings.' The Chavin Horizon is seen by Burger as an art style associated with spread of a religious cult, not as part of an expansionist empire, the art and cult being reinterpreted and adapted for greater relevance to ecological and cultural systems. 'Like all religions, the Chavin cult was faced with the paradox of trying to describe the undescribable and trying to evoke an experience not of this world while relying on materials, techniques and symbols drawn from the familiar environment and the people who inhabit it.' Burger draws attention to the depiction of the hallucinogenic cactus San Pedro on Karwa textiles and Chavin de Huantar sculptures, possibly used in evoking experiences 'not of this world', the restricted access to drugs or the knowledge behind the use of herbal cures must have been very important in the structuring of prehistoric Peruvian society. Isbell suggests that travelling Shamen—similar to the travelling herbalist-curers in Peru today—were the cause of the spread of the Tiahuanacoid iconography which depicts mythical beasts connected with the curing rituals. In the section on Late Horizon archaeology, with its strong emphasis on ethnohistory, Netherly describes in some detail the control of coca production and use on the western flanks of the Andes, where the Inca state established strong control over a particular ecozone, as the Chimu state had done before it, because of the ritual and political significance of the coca crop.

Each reader will be interested in particular periods or topics covered by this book but it is as a broad survey of recent works on Peru's past that it is most useful. It has undoubtedly greatly increased my own understanding of Peruvian Prehistory, but more importantly it has suggested new questions to ask of the available data and areas where new data must be collected to answer some of our more basic questions.

BILL SILLAR

LEICK, Gendoline. *A dictionary of ancient Near Eastern architecture; with illustrations by Francis J. Kirk.* London: Routledge, 1988. 261 pp; illus. (plates and line drawings). £35.00

This book is clearly written and easy to use. It will be very useful to general readers and students at an introductory level. The entries in the dictionary fall broadly into two groups, one describes the major architectural features of the major sites of the ancient Near East, while the second is effectively a glossary of architectural terms.

The reader will find clear summaries of the major architectural features of important sites in Egypt, Anatolia, Syria, Palestine, Mesopotamia and Iran. Inevitably, the approach is selective; to be able to compress the entry on Jerusalem to one column indicates the level of detail provided. (It is perhaps less useful to have entries such as 'Syro-Palestinian architecture' compressed to three columns). Some sites, such as Abu Shahrein, are listed under their modern names, but the majority, such as Ur and Uruk, are listed under their ancient names. There is good cross- referencing where necessary so this does not present a problem. It is on the other hand, mildly tiresome to find all sites with the prefix 'Tell' listed under T as with Tell el Amarna.

It is as a glossary of technical architectural terms that this book should be most valuable, but the dictionary is not exhaustive, and the author does not seem entirely happy with some of the terms listed. For example, she seems to equate the terms vault and dome, and refers to the same feature in Tepe Gawra VIII as providing evidence for the true arch, which it does, the vault, and the dome, which it does not. More line drawings would have been useful in explaining technical terms. There are some surprising omissions; no entry is found for entasis, for fresco, or for town planning, while entries for door, floor and wall are perhaps superfluous and the entry for lintel says misleadingly, 'see Jamb'. It would also have been useful to have something on systems of measurement, the cubit and the so-called great kush for instance.

This book presents the reviewer with something of a problem. There is no introductory statement and it is not al all clear what readership the author is aiming at. The dictionary seems to fall slightly between two stools in that it is not technical enough to explain architect's terms to archaeologists. Nor on the other hand is it detailed enough on the archaeological side to be of use to those needing specialist knowledge of the ancient Near East. The readers to whom it will be most useful are perhaps those doing rather general courses on ancient civilisation at 'A' level, or introductory courses in their first year at university. For this group of readers it will provide a real service. A revised edition in the future with the emphasis on the technical architectural terms would be extremely valuable to a much wider readership.

HARRIET CRAWFORD

LEROI-GOURHAN, André. *Dictionnaire de la préhistoire.* Paris: Presses Universitaires de France, 1988. 1222 pp; illus. FF 495

TATTERSALL, Ian, **DELSON**, Eric and **VAN COUVERING**, John (eds.) *Encyclopedia of human evolution and prehistory.* New York: Garland, 1988. xxxvi, 603 pp; illus. $87.50

The *Encyclopedia of Human Evolution and Prehistory* and the *Dictionnaire de la Préhistoire* represent two very ambitious attempts at archaeological lexicography. The scope of the Leroi-Gourhan is much wider than that of Tattersall so it would be an injustice to try to make a direct comparison between the two.

The Tattersall takes an overview of the palaeolithic, but the use of the word 'prehistory' in the title is likely to mislead as the book is by no means a world view of the prehistoric

period up to the historic or proto-historic period. The Leroi-Gourhan more adequately answers to this description. The Tattersall also differs from the Leroi-Gourhan in that it offers potted biographies of significant contributors to the field of study.

If one uses the palaeolithic (the epoch both works have in common) as an example of the respective works completeness, it can be seen that the Leroi-Gourhan work refers to more sites and subjects within that period than does the Tattersall, which is almost wholly devoted to the period.

When dealing with individual sites the Leroi-Gourhan has the advantage over the Tattersall. For example, the analysis of Solutre takes a full nine column inches in the Leroi-Gourhan whereas Tattersall accords it only 2 1/2 column inches. Old Crow, an American site, is accorded 2 column inches by Tattersall but Leroi-Gourhan accords it 5. The old saying 'quantity not quality' has no meaning here for anyone searching for hard facts about a particular site. The site entries in the Leroi-Gourhan abound with details. The referencing of the entries in the Leroi-Gourhan is far more complete than that in the Tattersall.

The quality and accuracy of definition varies considerably throughout both works. Some allowance must be given to the difference of understanding between French and American terminology. However, there are inaccuracies in both works too numerous to mention here without running the risk of pedantry.

The illustrations in the Tattersall are superior to those in the Leroi-Gourhan which, in many instances, have suffered in the reduction process. Nor are the photographic plates of the latter as clear and crisp as those in the Tattersall.

Inspite of these criticisms, it must be said that the two works form valuable companions to each other and are useful key guides for students of prehistoric archaeology and anthropology. Any subsequent revisions will most likely eliminate their respective errors. The Tattersall holds together quite well as a general introductory text for the student of the palaeolithic. The Leroi-Gourhan is, as its title states, a dictionary and, therefore, a reference book. Stylistically the Tattersall is a much more entertaining work.

J. MICHAEL HOADLEY

MacRAE, R.J. and **MOLONY**, N. (eds). *Non-flint stone tools and the palaeolithic occupation of Britain.* Oxford: British Archaeological Reports, 1988. iv, 263 pp; illus. (BAR British series, 189) £16.00

The volume contains twenty contributions, divided into seven sections, in addition to two introductory papers and a gazeteer of Lower Palaeolithic non-flint artifacts.

The scene is set with the more northerly geographical range of the British Lower Palaeolithic being explored by Wymer. Detailed sections follow on various aspects of non-flint artifacts from the British Midlands, the Upper Thames, and in Southwestern Britain. In addition to this a separate section covers non-flint assemblages from caves and a further section presents the research data from the experimental replication of non-flint artifacts. The volume is rounded off with a gentle stroll through the non-flint using technologies of the African Stone Age and concludes with the gazeteer.

Middle Pleistocene research in Britain is quite rightly becoming an increasingly multidisciplinary field of study. In keeping with this spirit it is to the editors credit that they include a number of papers that deal not only with non-flint artifacts, but with the context of their discovery. This is best illustrated by the section on the upper Thames. Here, amidst the archaeological contributions, lurk Bridgland and Preston who independently examine different possible sources for non-flint raw materials in the area. Briggs on the other hand offers a model that attempts to combine the

circumstances of artifact discovery with their geomorphological and postulated environmental context. A short contribution by Wallis combines the context of artifacts discovery with technological observations on the use (or rather not!) of natural paltforms in the knapping of quartzite pebbles.

The comprehensive and 'broad minded' coverage of the upper Thames is sadly not reflected in the other sections. In the section on the Midlands, virtually no mention is made of current work being undertaken on the status of the Wolstonian glaciation. We are presented with the orthodox view, almost as a *fait accompli*. The age of the Midlands diamictons are of considerable importance to the chronostratigraphic position of the non-flint artifacts under discussion. I felt that even a short paper outlining some of the implications for the archaeology of this re-assessment of the Midlands glacial stratigraphy would have greatly enhanced this section.

Many of the archaeologial papers in all the sections dwell rather too much on typological considerations. The commendable section on experimental replication suggested a number of interesting conclusions. Not the least of which was that controlled flaking in certain non-flint raw materials is, with experience, quite possible. However, more often than not the shape or poorer quality non-flint artifacts (and hence their typological determination) will have been influenced by the shape of the original nodule. This lesson was not explored as much as I felt it could have been, even by authors such as Saville, Tyldesley and Roberts who all demonstrate an awareness of technological problems.

This led to a great many of the individual contributions becoming little more than written catalogues of typological identifications. I felt that most of this information could have been banished to the gazeteer. This would have allowed many authors to develop individual lines of research rather than produce unnecessary artifact lists.

I applaud the spirit of Roe's introductory justification of Inskeep's highly readable paper on the non-flint component of the African Stone Age. The British Palaeolithic cannot be studied without reference to other areas. However, I must confess that in a volume otherwise *entirely* dedicated to British evidence, I found it rather out of place.

I do not wish to be unduly negative. My overall impression of the volume was a favourable one. As I understand the aims of the editors, they did not intend to produce the definitive work on the subject. Rather they attempted to produce a volume that would point the student in the direction of a previously untapped, but rich resource. In this they have succeeded. As a flint technologist I found the volume interesting, informative and in parts, enjoyable. I for one will be taking a keener interest in the development of this rewarding field of research in the future.

JOHN MCNABB

MILLER, Mary Ellen. *The murals of Bonampak*. Princeton: Princeton University Press, 1986. xvii, 176 pp; 53 figs; 65 pls (some col.) £47.50.

This is the most detailed study published so far of the mural paintings of the Maya site of Bonampak, Chiapas, Mexico. It is a handsome publication that consists of seven chapters and an appendix.

The first chapter deals with the history of the discovery of the wall paintings at Bonampak, so named by Sylvanus Morley, and also assesses the contributions of the archaeologists and conservators and travellers involved in the explorations. The most important aspect of the find of Bonampak was no doubt that it helped to re-evaluate Maya society as it really was and not as scholars wanted it to be.

The second chapter refers to Structure 1 and the paintings. Three rooms of murals depict a series of ritual events which took place

between AD 790 and 792, just about the time of the Classical Maya collapse. Iconographically, the programme begins in Room 1 with the event that is commemorated throughout: a child is presented to the court of what Miller calls 'fourteen lords'.

In chapter three Miller examines the inscriptions of the murals. She emphasises that at present not only can the historical content of many Maya glyphs be understood, but in many cases, even a phonetic reading can be attempted.

Miller uses the numbering system of R. Aldrich and R.E.W. Adams (1980) for the figures in the murals (1980). She has like wise revised their lettering schema for the Initial Series Text.

Miller makes a good point that one of the problems in identifying the hieroglyphs at Bonampak is due to the fact that these (unlike most extant historical inscriptions) were painted rather than carved. And one particular problem is, for example, the identification of the glyphs for a defeat.

Chapters 4 to 7 deal with the epigraphic and iconographic evidence involving the heir, the king's celebration in honour of the new heir, the ruler in the battlefield and the captives brought from battle to shed their blood with the culmination of the royal family letting its own blood.

Miller quotes Thompson's work on numerous occasions, sometimes emphasising that he is wrong. She recognizes the fact that 'his terminology is thoroughly embedded in the pre-Columbian literature' (p. 96). Thompson's work was no doubt an excellent point of departure for Miller's study, even if he failed to realize some aspects for which many modern scholars criticize him, for instance the prevalence of warfare among the Maya.

Miller's detailed iconographic study is excellent throughout. My main criticism is that she takes for granted familiarity with some art historical terms, e.g. 'an emblem glyph'. She says that emblem glyphs are place-glyphs (p. 50), and also suggests that emblem glyphs symbolize dynasties ... (ibid). But she never defines what she means by this. A definition at the start would have avoided this confusion.

Another minor criticism is the reproduction of both the colour and the black-and-white photographs. Such a splendid publication deserves a better and more reliable colour scheme. All in all, Miller's *Murals of Bonampak* is to be recommended. Her book will remain no doubt as a classic work even if the paintings were to disappear one day.

ELIZABETH BAQUEDANO

MORPHY, Howard (ed.) *Animals into art: [papers from the World Archaeological Congress held in Southampton in 1986]*. London: Unwin Hyman, 1989. xiv, 465 pp; plates (25 col.) (One World archaeology, 7) £50.00

This lavishly illustrated volume resulted from the World Archaeological Congress held in Southampton in September 1986. The essays that it contains explore the complex implications of the ways in which people have represented animals in their art and they contribute to the understanding of the role of art in human culture. Until recently, art has been neglected as a source of information about prehistoric cultures. This work makes a substantial leap forward toward rectifying this failure.

The main limitations of earlier analyses were that they failed to integrate the art with other archaeological data and to use analogous methods for interpretation. This new survey does not neglect non-European art as a source of information.

Animals into art argues that in prehistoric art we are dealing with different systems, a multiplicity of functions and determinations. The art tells us more about the humans than the animals they depicted. It makes the point that it is not really possible, in most instances,

to assign the animals represented to species and that stylistic differences and artistic licence are important factors that need to be considered. The negation of the human form points to a stronger identification with the animal representations. This argument moves nearer to the idea of totemism; one of a number of possible functions I feel to be singularly neglected in earlier analyses.

Of special interest to students of Palaeolithic art are Jean Clottes' *Identification of Human Man and Animal Figures in European Art,* Michel Lorblanchet's *From Man to Animal and Sign in Palaeolithic Art*, and Anne Catherine Welté's *An Approach to the Theme of Confronted Animals in French Palaeolithic Art.*

Welté makes a number of interesting points. She demonstrates that oppposed animals occur more often in the Magdalenian phase, both in the parietal and mobiliary art. These representation reflect complex underlying conceptual patterns that are variable in place and time. Various reasons for this type of representation are discussed; fighting, sexual parade, and ornamental ascetics. They may be influenced by their location and situation or they may have symbolic meaning (at Rouffignac 68% of the animals are represented in opposition.)

Regardless of the reader's predisposition, this volume will provide plenty of stimulating argument and encourage further research into this most fascinating aspect of prehistoric cultures.

J. M. HOADLEY

NEEDHAM, J. *Science and civilisation in China. Vol. 6: Biology and biological terminology: pt. 2: Agriculture,* by Francesca Bray. Cambridge: Cambridge University Press, 1984. xxvii, 724 pp; 271 figs; 13 tables. £55.00

This volume is something of a departure from the preceding volumes of *Science and Civilisation in China* series in that it is the first to be written in its entirety by someone other than Needham, and also because agriculture is considered much more prosaic than preceding subjects. At least this seems to be the author's opinion—'Agriculture is not a science but a technology' and again 'this is not voyage of intellectual discovery'. This seems a rather unnecessarily apologetic attitude especially as one of the great strengths of the series has been the integration of science and technology. Fortunately this volume continues happily in that tradition and although botany is dealt with in a separate volume, the source material for this work is drawn from scientific treatises, botanical manuals, as well as agricultural books, economic histories, archaeological discoveries and surviving traditional practise. The latter was studied at first hand by Francesca Bray, and has been of considerable value.

This volume covers all aspects of arable farming, especially cereal production which was so predominant in Chinese agriculture. Some other food crops, such as tea and sugar which require complex preparation, are to be dealt with in a future volume quaintly entitled 'Agricultural Arts'. The production of vegetable fibres for textiles has always been an important component in Chinese agriculture but this will be dealt with separately in Vol. 5 Pt. 1, devoted to textiles. Much of the technology of water management, dams, canals, pumps etc, so vital to the production of rice has already been dealt with in Vol. 4 Pt. 3, and the present volume takes the technology of irrigation as being understood and concentrates on its agricultural and economic significance. Finally animal husbandry which played such a small part in Chinese farming has been omitted altogether.

The book is broken down into six sections including a broad survey of the principal food growing areas of China and the origins of food production in the Far East, a survey of the

principal texts used, and then sections on field systems, agricultural implements and techniques, and crop systems. The final section is very different and there Francesca Bray attempts broader considerations of the effects Chinese agriculture may have had on the European Agricultural Revolution of the 18th century; whether China had a 'Green Revolution' in past ages and if so why this then failed to produce a corresponding Industrial Revolution as understood in the European sense. This is potentially one of the most important and interesting sections in the book and the sort of thing that Needham tackles so well, but here the treatment is rather disappointing.

Each of the first five sections is complete in its own right, indeed almost too complete. By the time section five is reached most aspects of arable farming have been dealt with, and there is considerable repetition from earlier sections as farming practise is described this time from the position of the actual crops themselves. Sometimes this even goes as far as repeating quotations from earlier texts, thus the same (lengthy) passage is quoted on page 294 and again on page 503.

Agriculture in China embraced two totally different systems. In the north dry farming evolved initially from millet and then to include wheat and barley as well, whilst in the south the cultivation of rice in semi-aquatic paddy fields developed. Cereal production in both regions was predominant with some legumes, oil crops, and vegetables as well as fibre crops and cash crops such as sugar, silk or tea which could be locally of great importance. Little or no land was devoted to pasture and fallow, and woodland or waste were both rare. From early times there was concern to maximise production to feed the population, nothing was wasted and every ingenious device was pressed into service including floating fields on open water and even the straw could be soaked in sea water before burning it to produce salt.

Another aspect of this drive to maximize the return from the land were the many important technical developments in agriculture of which the most important and internationally significant were the iron plough with integral mould board for turning the sod, the seed drill and multiple harrow for weeding between the rows of drilled seeds. These all seem to have been in use in northern China over 2,000 years ago and it is beyond dispute that at this time cereal production was way ahead of the West. The part played in introducing the new technology by the central authorities is especially interesting with the state iron foundries turning out cast iron (actually spherical graphite iron) plough shares by the million for distribution to the peasants; and the establishment of quite deliberate and comprehensive agricultural training and modernisation programmes in a manner that has only been adopted by the rest of the world in the very recent past.

The Chinese ploughs, seed drills and harrows all became well known in Europe in the 18th century just as similar equipment was being developed there and the extent of possible Chinese influence has to be considered. Bray sets out the evidence very fairly and comprehensively and shows that all of these developments had earlier, if largely unsuccessful, European precursors, and that some apparatus such as the seed drill had been in use for millenia in the Middle East. Also none of the inventors of apparatus or new methods acknowledge or even seem to have been directly aware of the Chinese or Indian methods. Thus she concludes that European developments were probably largely independent, although some types such as the iron ploughs introduced by the Dutch in the 17th century must have been influenced by Chinese ploughs which by that time seem to have been common over much of the Far East.

As usual in this series one detects that there has been a considerable effort to try and establish that Chinese thought or technology lay behind a major European development, thus in the foregoing discussion on the plough it is stated that 'we must regretfully conclude that

the turnplough developed independently in the East and West'. Why is it to be regretted?

These and other broader issues are dealt with in the final section, not always very satisfactorilty. Bray sees the mechanisation and intensification of agricultural production as not just part of a more general mechanisiation of production but as a necessary precursor for it. Thus the so-called Agricultural Revolution of the 18th century in Europe was a necessary precursor leading almost inexorably to the full Industrial Revolution. Thus if China experienced such revolutions in the Han and again in the Song dynasties why was there no corresponding Industrial Revolution? Bray suggests that the resons were more socio-economic than technical. The fields and the individual holdings in the main rice growing area of the Yangtze were too small to allow mechanisation, and the absence of large estates run by educated landowners interested in agricultural reforms are given as the reasons that the development did not progress further. This seems too much of an over simplification especially as the large continuous estates did exist in the north, and as it is stated elsewhere the technical improvements encouraged by the Chinese governments in fact helped the rich estates at the expense of the peasant holdings, even when the opposite effect was intended.

More generally it does not seem obvious that an agricultural revolution necessarily precludes a more general mechanisation, in fact it seems more likely that the industrialisation of Europe created the need for increasingly efficient and mechanised food production to feed the ever growing population. Much closer to China, the industrialisation of Japan was achieved without any reference to agriculture which remained in its traditional state until after the last war.

To some degree the problem is one of definition—what is meant by the Industrial Revolution and how much should it be seen as a separate distinctly European phenomena? Another problem is that of time. The pace of technical development since the 18th century has been so rapid and so overwhelming that we tend to regard technology elsewhere as both stagnant and largely irrelevant. Yet this is surely erroneous even for Chinese agriculture which Bray considers to have been essentially quiescent for the last millenia, many of the new food plants from the Americas were taken up by the Chinese very quickly to become major crops. It could also be argued that major technical advances did accompany the increases in agricultural production, notably in metallurgy and ceramics but at a pace that was more in keeping with what had gone before rather than at the headlong pace of the modern world wrought by the Industrial Revolution. What remain unexplained are the reasons behind the sudden acceleration of technical development and the special conditions which triggered it initially in post-medieval Europe rather than in China, India or the Middle East, centuries earlier.

This book is a detailed study of all aspects of cereal production in China abundantly illustrated and backed up by descriptions from contemporary texts, both Chinese and European, together with descriptions of present day traditional practice all skilfully interwoven to give a coherent and convincing text. It is a major advance on our knowledge not just of Chinese agriculture but of the development of agriculture generally.

Needham's inimitable style manages to be both magisterial and coloquial at the same time. Bray wisely does not attempt to emulate too closely but the book is clearly and well written, with the rather light, sometimes humourous touch, which permeates the whole series and makes them all such a pleasure to read. The present book, then is also heartily recommended.

PAUL CRADDOCK

O'KELLY, Michael K. *Early Ireland: an introduction to Irish prehistory*. Cambridge: Cambridge University Press, 1989. 375 pp; 169 illus. Hbk: £35.00; pbk: £14.95

This is a book which satisfies the long felt need for a general synthesis of Irish Prehistory. I am sure that students especially will recognise the value of this lucid and charmingly written work. It reflects the author's love for his country and for his subject and I am only sorry that he didn't live to see it finally published. This underlines the debt we all owe to his wife, and those who helped her to see it through to a successful conclusion. It will remain a fitting memorial to him for many years to come. Glyn Daniel in his preface to the book describes Michael J. O'Kelly as 'never insular', and the text reflects that, as he refers to comparable instances in British and European prehistory wherever they occur. This will ensure it, I feel, a wide acceptance in the overall account of European prehistory.

The book contains a number of thought provoking passages, and I found myself going back to reread some of these, particularly the Mesolithic section where there is much good information on recent work by Professor Woodman and others. The question of a lack of continuity between the Early and Late periods being particularly interesting. The Beaker period again provides an interesting contrast, with no classic Beaker burials, and Beakers not superseding indigenous forms. They appear perhaps as a prestige object, with a concentration in the north, whilst they are absent in the south west, where the earliest evidence for metal working occurs. The section on 'Beaker squatters' at New Grange, and the environmental evidence of their economy, provides more information than we have from some Beaker sites in this country.

All the time there is a beautiful simplicity of language used in exactly the right place to make it memorable. To say that the Neolithic way of life was introduced by 'Irish natives returning from abroad, or enticed here by what they had heard from Irish travellers', is to provke me into envisaging a prehistoric Bord Failte, (Irish Tourist Board) already singing the praises of the Emerald Isle. I don't disagree with this opinion, I'm sure it happened exactly that way!

The large number of megaliths still surviving in Ireland provide material for a very full discussion on megalithic tombs, their purpose, and their builders. Single burials, earthen and stone enclosures are also dealt with. The Irish Bronze Age with its masses of gold objects, some of extraordinary workmanship, makes fascinating reading. It is in this part of the book that I can detect an underlying indignation at the amount of fine artifacts that have been lost. The fragile nature of the gold lunulae always suggests to me a new gentility that we haven't seen in earlier periods. I also particularly liked the description of the cremation pots with 'soul holes', to allow the spirit occasional excursions. Another interest is kindled by the section on 'cooking places', and in particular by the experiments carried out using the actual cooking trough and oven at the Bronze Age site at Ballyvourney, Co. Cork. This is intriguing information indeed, and I shall remember it when the next power strike looms.

The Iron Age chapter contains a good section on early language, and the deciphering of the Ogam stones. The Iron Age evidence is sparse and highlights the difficulty of providing a chronological framework for this period in Ireland. The hill forts are dealt with, and it is interesting to read of, and appreciate the importance of Navam fort, so recently saved from destruction. The book ends, not with the coming of the Romans, they obviously didn't believe they would receive the hospitality promised by those early Irish travellers, but with the advent of Christianity.

An excellent book, with a good layout, clear illustrations, and helpfully labelled drawings. The student, in particular, will appreciate the four apendices on Radiocarbon dating, Dendrochronology, Pollen Analysis, and Radiocarbon calibration.

J.B. MCLEISH

ØRSTED, Peter *Roman imperial economy and Romanization: a study in Roman imperial administration and the public lease system in the Danubian provinces from the first to the third century* AD. Copenhagen: Museum of Tusculanum Press, 1985. 415 pp; 2 maps. DKr 350.00

The consent or acquiescence through which Rome ruled a good deal of her empire unopposed derived from self-interest. Native ruling classes were generally disposed to accept an authority that protected their own position, in return for which they paid respect to the emperor, maintained good order and paid their taxes. In this rather technical study, where the Latin of the lawyers looms large in the introductory section, the author examines an important but somewhat neglected component in the social and economic power structure of the Roman Empire, the system by which Roman citizens of property could share the profit of empire through leasing the management and collection of public assets and revenues. The examples chosen for study are the iron mines of Noricum and the customs district of Illyricum, for both of which there has survived a quantity of epigraphic evidence from the first three centuries AD.

The customs district of Illyricum *(portorium publicum Illyrici)* remained base in the former province of that name, with a head office *(tabularium)* in Pannonian at Poetovio on the river Drava, even after it had been extended to include Dacia, Moesia and the lower Danube. Under the Roman system of leasing *(locatio)* the contracts were accessible to Roman citizens whose landed property was sufficient to form a collateral bond. In the early days the leaseholders *(conductores)* were for the most part immigrants to the area, probably from nearby northern Italy, though they may have included some enfranchised natives who became established in the new communities which grew up on the Panonian Highway between Aquileia and the Danube. In the first century the Middle Danube was attractive to outsiders eager to take up the lucrative business of gathering the profits of the empire from a large number of recently conquered peoples. Later the newly-constituted native cities *(municipia)* in Noricum, Pannonia and Dalmatia, offered the same opportunities through enfranchisement to the local nobility. There is no suggestion that office-holding families, even in small country towns, were reluctant to take some profit from managing what were now the public assets of the Roman state, notably agricultural lands and the mining of metals. 'Urbanisation, citizenship, and paticipation in public economic activity were the means; the payment was the potential social, economic and political possibilities of Latin and Roman citizenship and partaking of the income of the Empire; those who paid were the *peregrini*' (p. 357). That definition implies that the process of Romanization, at least in part, stemmed from a conscious economic policy, which not all will accept. On the other hand, the evidence from the particular operations studied does seem to support this view and also indicated how the once newly-conquered peoples of Illyricum could join in the exploitation of later conquests, notably Trajan's conquest in Dacia and along the lower Danube.

The system of leasing land had evidently ceased by the early third century, when the customs are known to have been under the direct management of imperial officials, many of them ex-slaves. The old organisation, which included the lucrative taxation of cross-frontier trade, appears to have collapsed during the German and Sarmation wars in the reign of Marcus Aurelius. It appears to have been Septimius Severus who in effect 'nationalised' these and other sources of public revenue. One assumes that the interests of the class that had once profited from the leases counted for little in the face of a desperate need for cash to pay the army. When Caracalla extended citizenship to all freeborn inhabitants of the Empire it was plain that a once attractive status was no more than a source of burdens, carrying the

dues of inheritance and manumission as well as the burden of public service. The city, that distinguishing institution of classical antiquity, had declined to a mere instrument of coercion. The effort once expended to connect oneself to a city economy and that to the public economy was now directed to precisely opposite ends, the obtaining of exemptions and the protection from burdensome entanglements.

J.J. WILKES

[**PORADA**, Edith] *Monsters and demons in the ancient and medieval worlds: papers presented in honour of Edith Porada;* edited by Ann E. Farkas, Prudence O. Harper and Evelyn B. Harrison. Mainz: Verlag Philipp Von Zabern, 1987. xv, 1114 pp; 51 pp. of plates. (The Franklin Jasper Walls lectures) DM120.00

This volume, presented in honour of Edith Porada, contains a series of papers resulting from a symposium and exhibition on Demons and Monsters in the Ancient and Medieval World. Its dual purposes are to celebrate Dr. Porada's career as scholar, teacher and curator, and also to continue the theme of the symposium which sought to demonstrate the connection between art and thought in the Ancient Near East and also during later periods. It must be noted, however, that despite the title and these stated aims, only the last paper (of nine) deals with the medieval periods—with the heaviest concentration being on Egyptian, Anatolian and Sumerian art.

Some of the most interesting discussion takes place in the introduction, written by Edith Porada, and demonstrating her breadth of knowledge; understanding of the various cultures discussed; and her superb ability to synthesise the aims and contents of the papers presented. This breadth and ability is perhaps best demonstrated by a quotation from this introduction—a quotation which, if constantly referred back to whilst reading the other papers, enriches the entire volume, encapsulating its aims as it does so well.

'The study of the monsters and demons of a given culture obviously provides insights into the pictorial imagination of the people, their mode of thought and also into some of their religious beliefs ... This subject not only provides new knowledge about various demons and monsters but also reveals hitherto unknown aspects of the character of the civilisation which brought forth such creatures.' (p. 3)

Several of the papers bring out this relationship between iconography representing demons and monsters and othewise largely 'hidden' aspects of culture extremely well. For example, P. von Blackenhagen's essay on 'easy monsters' where he examines the changes that Centaur and Pan figures underwent as they were used to represent different ideological trends; the discussion by H. Fischer of ancient Egyptian attitudes towards the monstrous; and also D. Hansen's detailed examination of a group of seal impressions from ancient Lagash.

This latter article is a particularly fine example of the way studies which although superficially may seem to deal purely with the detailed and individual can in fact tackle concepts and interpretation symbolism and meaning. It is intersting to note that Donald Hansen also makes mention of Edith Porada and seems, perhaps, to adhere closest to the ideal of the volume.

As Donald Hansen suggests, 'Great learning or erudition can be truly overwhelming but sometimes leaves me with the feeling that the scholarship itself and not the essential meaning of the image is what has become the essential pursuit of the investigation' (p. 60). This is a feeling that one is fairly infrequently left with in this volume and it is a tribute to the authors as a whole that a person who has little knowledge of the majority of the periods under discussion finishes the book feeling a fascination with not only the generalisations but also the details and minutiae on which they are built.

On the actual production of the book I have only two main points; the plate quality is superb—and more than compensates for their being grouped at the end; however, the quality and placement of the footnotes can result in some pages (e.g. pp. 14 and 15) containing more footnotes than 'normal' text.

TWIGS WAY

RITCHIE, Anna *Scotland BC: an introduction to the prehistoric houses, tombs, ceremonial monuments and fortifications in the care of the Secretary of State for Scotland.* Edinburgh: HMSO, 1988. 80 pp; illus. (most col.); map. £3.95

In the current climate of opinion we are increasingly being encouraged to welcome visitors and explain archaeological sites and the surviving monuments to them. *Scotland BC*, published by the Scottish Development Department with the support of the Gateway supermarket group, is just the right level of publication for the casual visitor to the prehistoric sites of Scotland. It is a paperback of 80 pages, with colour photographs on each page, at the price of £3.95.

Anna Ritchie's approach is interesting: rather than write a chapter on each period, she has written by theme—houses, burial monument, stone circles, strongholds. There are lots of beautiful photographs, some reconstruction drawings useful to the layman and perhaps most attractive of all, reproductions of water colours of Machrie Moor stone circle, Maes Howe and the Ring of Bridgar as they appeared in the nineteenth century. Anna Ritchie, the SDD, and Gateway must all be commended for this attractive production.

DALE SERJEANTSON

ROGERSON, John and **DAVIES**, Philip *The Old Testament world.* Cambridge: Cambridge University Press, 1989. 384 pp; illus. (some col.) £19.50

This lavishly illustrated book (116 plates, many in full colour, fourteen maps and a number of time charts) appears to be of the 'coffee table' genre. The layout is extravagant, with 6 cm margins on every page of text (some plates and all the plate captions appear in this margin). All this is reflected in the price, £19.50. Closer attention reveals that this is far from being such a book, despite the publisher's sleeve notes that suggest that it is aimed at the general reader, student and any library with interests in the Old Testament world. This is not a book for the general reader or new student: those who have no background in Old Testament studies would find it difficult. For example, no discussion is given regarding the sources of the Pentateuch until Chapter 17 (pp. 360–3), and even this assumes foreknowledge. It is difficult to imagine how a reader with no such knowledge would be able to follow some parts of the preceding discussion. Indeed, at one point the 'J' source is mentioned without any explanation (p. 216). As for the assertion about libraries, this book is clearly best suited to the theological context.

The last point raises the problem of reviewing this book in the current context. It is not an archaeological treatment of the Old Testament era so it would be unfair to condemn it for being unsuccessful in archaeological terms. In their preface the authors maintain that 'This introduction ... aims to reflect the way in which the Old Testament is being explored and discussed in present-day scholarship' (p. 8, wrongly numbered p. 13 in the contents page). Introduction in Biblical studies has a specific sense: 'it is chiefly concerned with critical matters and is often very technical ... a book called 'Introduction to the New Testament' is unlikely to be a book for beginners. it is more likely to be a difficult book

discussing technical questions for advanced students if not for experts' (Stacey 1979, 210).

The book is in four parts dealing with 'The Setting' (Chapters 1–3), 'The History and Religion of Israel' (Chapters 4–7), 'Literature and Life' (Chapters 8–15)—the major part of the book—and 'The Formation of the Old Testament' (Chapters 16–17). Chapter 1 provides a useful thumbnail sketch of the geography, climate,vegetation and land use of the region from 1200 to 63 BC. It begins with a story from the New Testament (the good Samaritan) to provide an example for giving a setting. This is an odd choice; surely an Old Testament story, e.g. the selling of Joseph, would have been more appropriate. They claim that the land divisions they use, (based upon another authority) are the best (p. 16). I found them confused and over complex, and whilst even more complex divisions have been proposed (e.g. Bimson et al. 1985, 10), other authorities have simpler and more memorable land divisions (e.g. May 1984, 48–9). Moreover there is nothing here that could not be found in any recent Old Testament introduction. The same is true of Chapter 3, which deals in fair detail with Israel's neighbours (e.g. Boadt 1984, 28–51, 245–65). It is Chapter 2 that makes this section particularly fascinating, a discussion of social organisation using anthropoogical methods which is quite illuminating.

One major quibble is the use of maps. Many of the maps do not provide the information referred to in the text, the worst example being map 1 (p. 17) where many of the place names mentioned are not given (I counted at least nine, including Lachish, the second city of the region after Jerusalem!). In Part II another example is map 11 (p. 130) showing the extent of David's kingdom: its borders are off the page to the north, north-east, south and south-west!

Part II is a detailed, but conventional, survey of the history of Israel and Judah and is divided chronogically. It is refreshingly open about problem areas, and where possible solutions are offered, e.g. the succession of J(eh)oram (pp. 145–6), they seem eminently sensible. Nor do they necessarily attempt to explain away problems that still remain a riddle (e.g. the dating of Ezra p. 164).

Up until Part III (about halfway through the book), there is much that would be of interest to the archaeologist, though perhaps only in a superficial way. From Part III onwards there is little for the archaeologist unless he is specifically interested in using the Bible as an archaeological resourse, in which case this provides a good basis for assessing its usefulness.

One weakness of this section in particular relates to the author's use of the Old Testament and contemporary sources. They suggest that the theological basis of the Old Testament obscures its historical accuracy: 'we can often recognize a particular genre of narrative as historiography, but this is not the same as separating 'true' from 'fictional' (p. 218—see also p. 144), yet they appear to be happy to use other contemporary texts with little or no critical hesitation (e.g. use of Assyrian texts, p. 143) despite their warnings on this source too: 'even ancient forms of prosaic 'historical' writing ... found among Israel's neighbours, are shaped by aesthetic or at least non-factual considerations' (p. 218).

A comment about their objectivity is now appropriate. In the preface they assert that they have no particular theological view to expound. In attempting to be objective they have given the impression that although the writers of the Old Testament may have believed in God, there is nothing to substantiate the idea that the Bible is in some way inspired by God. Thus they are at pains to explain away everything in terms of writers who have particular views and who alter oral tradition, or even earlier scrolls, to harmonise with the writers' theology. One example will do service for the rest. 'Among the minor prophets we also find signs of an eschatological message. Hosea, Amos, Micah, Malachi, though not books of promise about Israel's future, nonetheless all end with

such passages' (p. 369). This is used as part of their argument that the Minor Prophets are a post-exilic invention. However other Biblical critics suggest that the ending of Amos, at least, was a much later insertion and out of character with the rest of the book which can be seen as distinctive and certainly allied to its professed time, about 746 BC (e.g. McKeating 1979, 97). Unlike other scholars who do not deny the difficulties of Biblical criticism, but who firmly accept divine inspiration at some deep level (e.g. Boadt op cit., 11–14; Jones 1980, 65–8; Stacey op cit., 16–17), one wonders whether the authors do, in fact, believe this to be the case at all.

It must be said though, that their careful and scholarly criticism in Parts III and IV has much to commend it, whilst Parts I and II, though mainly pedestrian, are useful summaries. There is little new material here, however, and much of what they cover has been adequately dealt with in other recent (and cheaper!) introductions e.g. Boadt (1984).

Finally, the editing of the book has been rather poor. There are some typographic errors, but worst of all no fewer than fifteen references in the text do not appear in the bibliography. Some of these are undoubtedly typographic errors, e.g. Otto 1976 (p. 347) may be Otto 1979 in the bibliography, but many are omissions, e.g. Crenshaw 1981 (p. 307), Gaster 1969 (p. 350), Lang 1985 (p. 40). Having said at the outset that this book is lavishly illustrated, I must take issue with the choice of illustration. Twenty-seven of the plates are Christian or post-Old Testament illustrations of Old Testament people and events (e.g the medieval Latin miniature showing the afflictions of Job, p. 325). These serve no useful purpose, but no doubt contributed greatly to its inflated price.

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BRUCE LEVITAN

ROGGENBUCK, Petra *Untersuchungen zu den Edelmetallfunden der römischen Kaiserzeit zwischen Limes, Nord- und Ostsee*. Oxford: British Archaeological Reports, 1988. [4], 332 pp; illus; 49 maps. (BAR International series, 449) £20.00

This work of Petra Roggenbuck constitutes her doctoral thesis completed at the University of Hamburg in 1988. As the title indicates, the book (BAR Int. 449), studies all of the Imperial Roman gold and silver finds, (excluding coins), from Germania Libera and represents the results of an enormous amount of research and analysis. The word 'all' in the last sentence is used in its strictest sense as the author collected over 3000 finds from every available source imaginable.

It is strange to think that this is the first work to attempt to study this field in any depth whatsoever and the results speak eloquently enough for its outstanding success and value to Roman Archaeologists in general and more specifically to those involved in taking the study of social and cultural develpments in Germania beyond the works of Tacitus.

Dr. Roggenbuck has approached the problem of studying the vast number and diversity of finds in an extremely systematical manner by categorizing each find individually and then feeding the information into various computer programs to produce results which can later

be interpreted and used to form some sort of model or conclusion.

The book starts with a chapter on where, how and why the finds were, and still are, being found, and continues by studying the forms in which gold and silver were used. Following this basic presentation of all the data the chronological and geographical aspects of all the information are analysed, including an interesting section in which all numerical considerations are ignored and the weight of finds is used as the main factor instead, which produces some alternative results.

The following chapters are even more specific in studying the finds from each findspot category, (including graves, stray-finds etc.), and broadening the discussion in order to discover if there are any relationships between gold and silver and the various other archaeological contexts involved.

Finally, all of the finds are listed in an extensive catalogue together with their places of discovery, a description and brief discussion on each. There is also an exhaustive bibliography covering every aspect of the subject.

It is very difficult to criticise a book of this sort which approaches a previously untouched field of study in a systematic and analytical way, enabling the reader to digest so much information relatively easily. The language in which it is written is very clear and concise, and the data is used logically from beginning to end. However, I felt that there was a distinct lack of interpretation throughout. Also, too much space was taken up by written discussions and descriptions of various forms of analysis when a brief resumé of each graph and/or map would have sufficed. Naturally, objectivity is important in such a study, and as far as is possible the data should be presented and analysed in a manner totally removed from all interpretation. However, once this has been achieved the results and conclusions need to be put into some sort of interpretative model-framework in order to be relevant, and it is a shame that the author here felt that this was not appropriate in her work and should be left to someone in the future.

PETER GUEST

RONEN, Avraham *Sefunium prehistoric sites Mount Carmel, Israel;* with contributions by Amnon Ben-Tor [et al.] Oxford: British Archaeological Reports, 1984. 2 vols (xxiv, 1–290; [3], 291–533 pp.); col. frontis; figs. (BAR International series, 230) £30.00

This is a final report on the archaeological work carried out at the prehistoric sites of Sefunium, Mount Carmel, which produced Palaeolithic and Neolithic materials, as well as data on the past and present environment of the vicinity.

The first volume deals with Sefunium Cave itself; formerly known by its Arabic name of Iraq al-Barud, it was previously sounded by M. Stekelis in 1942. The second volume decribes the terrace and adjacent rockshelter sites, discovered in 1962. Excavation was carried out by a team led by A. Ronen for 5 years, 1965 to 1970 and these volumes include the contributions of other authors, e.g. on the fauna (Tchernov), geology and sedimentology (Farrand), topography and vegetation (Inbar; Klein; Zaveh).

In the Middle Palaeolithic, the Sefinim sites evidently formed part of that dense 'Levalloiso-Mousterian' occupation of the Carmel which took place during the early Last Pluvial, already well-known from e.g. Tabun and Kebara Caves. A late date in the Mousterian era is indicated by fauna, confirmed by the artifact typology, which is likened to that of Tabun B. Site use, as between cave, shelter and terrace are dicussed, as is the probability that Transitional (Middle-to-Upper Palaeolithic) material is also present; this idea is based on blade morphology and 'mixed typo-technological attributes' in layer 12 which differentiate it from the Mousterian below and

the Aurignacian above. It is separated from the latter by a sterile layer (11), which must represent a considerable time gap since Aurignacian assemblages are dated elsewhere to around 30,000 BC, and succeed the earlier blade and point facies known from Lebanon and the Negev (Ksar Akil Phase B; Ahmarian). Such material is absent from Sefunium, but the Aurignacian is abundant and well-made with many flake scrapers, dihedral burins and a few El-Wad Points.

If the evidence for an Epi-Palaeolothic phase is problematic (three lunates; a stone-pipe fragment), the Neolithic is well represented in all three areas. The rockshelter is evidently a P.P.N.B. living site with structures (described by Lamdan) and the terrace had hearths from which a C.14 date of 7,500 BC was obtained. The toolkit includes celts, tranchet axes, tanged arrowheads, sickle-blades etc. The cave contained a 'stony complex 'identical to that in the Neolithic phase at Berez Cave, up the coast at Adlun, and both contained a 'Heavy Neolithic'/Heavy Duty Tool element. Post-Neolithic traces (Chalcolithic-Recent) are described by Ben-Tor.

The final conclusions are presented rather briefly, and more extended discussion of the comparative Levantine material would have been welcome. Nevertheless, the careful excavation methods and detailed analyses, plentifully illustrated, have given many new insights into Palaeolithic and Neolithic life on the Carmel.

L. COPELAND

SCARRE, Christopher (ed.) *Ancient France: neolithic societies and their landscapes, 6000–2000 BC*. Edinburgh: Edinburgh University Press, [1983]. viii, 390 pp; illus. £19.00

The title of this book does little justice to its contents; it is, in fact, a detailed survey of the French Neolithic, the first book in English to deal with this subject in any depth since Daniel, Piggott and McBurney's *France before the Romans*. The latter book is a general survey of French prehistory, with only one chapter devoted to the Neolithic. As such, *Ancient France* will prove most valuable to undergraduates and to anyone with a serious interest in European prehistory. British students are notoriously incapable when it comes to reading anything written in languages other than English, and this book will make the important data for the French Neolithic accessible to all, hopefully convincing at least some that the known world does not end at Dover.

The book consists of eight chapters, each written by a young British researcher and covering a particular geographical region. There is also an introduction and a final summary by the editor. Most of the chapters set out to explain, rather than simply to describe the evidence, though it should be said that the prevailing framework of interpretation is ecological/environmental, with little consideration of social factors.

Mike Ilett's chapter on the Early Neolithic of North-Eastern France provides an excellent synopsis of the complex Bandkeramik and epi-Bandkeramik sequence of that area; a sequence that has been much elucidated by recent research in the Aisne Valley, in which Ilett has played leading role.

Mark Burkill summarises the Middle Neolithic in the Paris Basin and Burgundy, drawing attention to the complexity of the sequence, often disguised by the simplistic characterisation of the French Middle Neolithic as 'Chassean', as though it formed a homogenous unit.

John Howell gives a clear and comprehensive account of the Paris Basin S.O.M. but it is a pity that the Chalcolithic of that area is glossed over; the assemblage from Fort Harrouard II is described as 'presumably Bronze Age', thus the Chalcolithic *Groupe du Gord* is not considered at all, although Beaker assemblages, which are later than *Gord*, are discussed.

Nigel Mills covers the whole of the Neolithic period in Languedoc and Provence, whilst Paul Bahn does likewise for the French Pyrenees. The extraordinary closed sites of Villeneuve-Tolosane and St.Michel-du-Touche are well covered by Bahn, and those of West-Central France are discussed in some detail in Christopher Scarre's own chapter; there are some interesting parallels to be drawn between these sites and our own 'cuasewayed camps'. It is, perhaps, surprising that Scarre, in discussing the Early Neolithic of West-Central France, makes no mention of the Augy-Ste-Pallaye assemblage from La Bajoulière, which raises the possibility of an epi-Bandkeramik influence in the earliest Neolithic of this area.

James Lewthawaite's account of the Neolithic of Corsica is especially valuable in being one of only very few general discussions of this subject in English or French; (the only other that springs to mind is in *La Préhistoire Française*).

Perhaps because of the spectacular megaliths, the Neolithic of Brittany is better known to British archaeologists than any other region of France, and it is good to see Brittany, Normandy and the Channel Islands covered together by James Hibbs. There are a few problems with this chapter; in describing the pottery from Le Pinacle as 'Bandkeramik tradition', it ought to be made clear that it belongs to the epi-Bandkeramik sequence, and not to Bandkeramik *sensu stricto*, as this could be a source of considerable confusion for the non-specialist. The 'extended burial' from Villes-Nouaux is entirely hypothetical, but is not even qualified by a 'possible' or probable'; since this would be the only example of a Beaker single inhumation in the Amorican area, more caution should perhaps have been exercised.

As one would expect of a book of this type, the coverage is not entirely consistent, and this, to my mind, is the book's greatest fault. The Middle Neolithic of Burgundy and Franche-Comte is admirably covered by Burkhill, but there is scarcely a mention for the Early Neolithic of this area, with the important sites of Gonvillars and Planches-près-Arbois, or for the Late Neolithic *Sâone-Rhône* culture. The Neolithic of the Massif Central, Alsace, Lorraine, and the French Rhineland and the Alps are mentioned in passing if at all.

One can find faults and shortcomings in any published work, but in general this is a good book, and one that must surely become essential reading for all students of European prehistory. The book sets out to provide a general introduction to the French Neolithic for the non-specialist English-speaking reader. In this aim, the book certainly succeeds; the chapters are clearly and concisely written, well ordered and accompanied by excellent illustrations. Each chapter is followed by a list of radiocarbon dates, which should prove particularly useful. The editor of and contributors to this volume are to be congratulated on the publication of a much needed book.

MARK PATTON

***Footnote**: Since this review was written, the author has learned that a second edition of* Ancient France *is due to be published at the end of 1989. Most of the chapters in this second edition will have been updated. M.P.*

VAN ARSDELL, R.D. *Celtic coinage of Britain*. London: Spink, 1989. xvi, 584 pp; illus; 54 pp. of plates. £40.00

This large and well produced book is a remarkable mixture of the excellent, the naive and the bad. There are 46 pages of comment and discussion which are very off-putting, to put it no more strongly. Pages 56 to 349 form a good catalogue with very clear illustrations and short sensible descriptions. There are tables of summary, by the newly set out classification and the trade names of the coins, and a series of plates, which give a complete overview of the coinage in superb detail. Further

tables give weights and metal contents, and a series of 80 maps, in pairs, give the distribution of various types of coins. A concordance means that you can move from numbers in Mack's earlier work, to numbers in the present work, but not vice versa. Lists of hoards give the deatils of the main coins found, there is a good bibliography, and a useful section on modern forgeries.

So the excellent part is the catalogue, set out coin type by coin type, with new numbers and very clear illustrations. This needs to be praised, for it will be very useful for anyone who wants to identify a coin, but there is trouble ahead for any reader who wants to follow things more deeply.

There are slips, but I don't think they need detain us—examples from the introduction include the misspelling of Barbara Pferdehirt and the location of John Collis in Durham. There will quite certainly be acrimonious wrangles as to whether type 95Qx should really be attibuted to Covdob, but I regard such matters as nit-picking. There are problems in the bibliography in which Cunliffe's 1981 publications become circular, and which Reece 1984 cannot be found. But these are not the main problems; the trouble seems to lie mainly in an absence of archaeological understanding, and chilling naivety.

Once the horrible introduction is passed, in which the Celts are accused of 'directing their brilliance to the PROCESS TECHNOLOGIES' (p. xi), the most uncomfortable section to read is that on Art and Design, pp. 31 to 45. We are assured that 'the images may be abstract, but they are intentionally abstract', and 'the imagery, no matter how incredible it may appear at first, is not due to lack of ability'. The general points are well worth making, but the gruesome phillistinism which assumes that anything not directly representational is incompetent or incomprehensible ought to be avoided.

One infuriating aspect of the book which will deter some readers by page 6 is the use of pointless footnotes. There are 132 notes, and they follow some interesting points which I kept on wanting to follow up—in vain. 71 of those 132 notes (53.8%) are to Van Arsdell forthcoming, and so they take you no further on at all. Reference to the bibliography reveals Van Arsdell forthcoming from 1 to 34, but unfortunately only 1 and 23 tell us *where* they will appear, the other 32 are lost forever. This is downright silly.

What about use as a mine of information—just what students, including myself, need for British coinages? Take dating: p. 56 'The chronology relies heavily on metrological and metallurgical studies (111)' yes, yes, what is that 111? Van Arsdell forthcoming numbers 27, 29 and 30. in fact things are not quite that bad, and the student who will work at it will get more information out of the book itself than the author seems to allow. Some of the metrological points are in the tables and likewise the metal analyses by Peter Northover, but it is very hard work sorting out the factual basis from the story written around it. What was needed was a clear statement of the basis for chronology, distinguishing hard material observation from interpretation, because that is all students need. It is still needed.

What about this lack of archaeological understanding? By what circumstances did a coin of Massilia get to Roman Richborough or Canterbury, and do these find-spots help the idea of Iron Age trade (p. 7)? What is the evidence, p. 8, for the Durotriges importing Kentish cast coins as metals scrap? In fact part of the answer comes on p. 10, metal analyses. On p. 12 the Durotriges are said to go into decline and become less prosperous once they lose the earlier imports from across the channel. What is the index of prosperity? Could it be the presence of imports? Page 54 on Bagendon, builds, on the excavator's foundations, I admit, a mint out of tongs, ladles and 'coin moulds', when they were not even found together or on the same part of the site. And p. 539 makes the coins found there were 'not necessarily a hoard, though the coins were found in a relatively small area'—but that

relatively small area included a large number of very different deposits separated by major vertical and horizontal discontinuities. The coins at Bagendon might all have been at one time in a bag together, but that is an act of faith which has no connection with the archaeological facts.

And yet, when we get down to detail, on the inscribed coins of the Dobunni, a very good case is made for re-ordering them according to metal content and weight. And an excellent case for cross-linking coinages of different tribes or areas by widespread debasements is almost obscured by the pseudo-historical framework. It really is important that the SE of Britain can be seen experimenting with ways of casting bronze coins and developing a refined technology: and the ways of debasing gold by delicate manipulation of a three-metal alloy so as to avoid detection is a brilliant discovery. The catalogue is what I shall use in future to identify any British coin I may be shown. If only someone had read critically through the manuscript to prune the infelicities.

RICHARD REECE

VICKERS, M. (ed.) *Pots & pans: a colloquium on precious metals and ceramics in the Muslim, Chinese and Graeco-Roman worlds. Oxford, 1985*. Oxford, Oxford University Press for the Board of Faculty of Oriental Studies, 1987. 233 pp; illus. (Oxford studies in Islamic art, 3). Hbk: £25.00; pbk: £15.00

The papers in this volume seek to explore 'the dependence of the potters' craft on that of the gold and silversmith'. They also seek to gain some insight into the use, ubiquity and general attitude to plate in the Classical, Islamic and Chinese civilisations. Only a minute fraction of the plate has survived and it is only by exploring the contemporary documents and other literature that some idea of the true availability of gold and silver can now be gauged. These can take the form of inventories, such as those which survive from the Greek temples, described here by D.M. Lewis, or of the Ottoman court, described by Michael Rogers, or of other references such as those quoted by Craig Clumas on gold and silver vessels in Ming China and Assadulah Souren Melikan-Chiruani on silver in Medieval Iran.

The general conclusion of all these papers is that despite religious or philosophic disquiet about ostentation and display of wealth, gold and silver were in regular usage by the upper and middle classes, and that individuals could sometimes own quite enormous quantities of plate. The attitude of early Islam towards gold and silver is discussed in Juynbull's fascinating paper. The early followers of the Prophet were decidedly against all show of wealth and statements such as 'verily he who drinks from silver vessels will have Hell fire gurgling in his belly' are fairly typical. However, gold fillings in teeth and in one instance an artifical gold nose were permitted. Vessels could be repaired with silver, but the true believer should ensure that his lips did not touch the metal. However, the rules were soon relaxed, and legalists could point out that they forbade only drinking from silver vessels, eating was allowed. Inevitably standards slipped and by the 11th century even the mosques themselves were richly adorned, the doors and mihrab of the Ka'ba mosque in Mecca were of gold and silver for example. James Allan claims that there was a serious shortage of silver in the Islamic world in the 11th and 12th centuries as evidenced by the almost total absence of silver coins. However, Melikan's carful review of the contemporary literature suggests that both domestic plate and even architectural fittings were not at all uncommon, and Allan rather dishes his own case by quoting how a Sultan was forced to strip 2,200 kg of silver and gold from the buildings of Damascus in 1374. A shortage may have made this necessary but apparently even after several

centuries of supposed silver famine over two tonnes could still be collected from the buildings of one city. I very much doubt whether the silver fittings of the churches in present day London would approach that wieght.

The relationship of ceramics and plate is explored in a number of papers and the general conclusion is that ceramic vessels were everywhere held to be vastly inferior in both prestige and price. Even the quality wares of Greece and China which now fetch astronomic prices in the saleroom seem with very few exceptions to have been very cheap when they were made and to have been largely intended for plebian use. Thus Fulford in his excellent piece on the place of ceramics in the Roman world quotes Plautus in a scene where only the slave drank 'from his little Samian jug', definitely not the master; and by Samian he means the Arretine fineware which we nowadays associate with the best prestige tableware.

There seems no doubt that in most cultures many of the ceramic vessel shapes were influenced by the shapes of the contemporary metalwork. This applies equally well to the familiar European porcelain dinner service as to the Greek, Chinese and Islamic vessels discussed in this volume. This aspect is covered by W. Watson and Tregar for China and by Raby for Persia. In a cross cultural work such as this perhaps the opportunity should have been taken to discuss for example the medieval Chinese vessels made for export to Persia which directly copy the shape of the contemporary inlaid Islamic brasswares. It is interesting to note that the Persian lustre-painted fritwares of the 13th century follow the decorative scheme of the metal vessels quite closely whereas the standard blue-on-white decoration on the Chinese copies is totally different. Could it be that the Islamic customers wanted their relatively prestigious imported porcelain to still be recognisably Chinese, although based on a local metal shape?

Ceramic wares although influenced in shape only rarely directly copied the decorative design and actual surface texture and colours. This was another area that could have been usefully explored in this volume especially for the Islamic lustrewares which surely were copying real metallic surfaces of copper or silver. The Victorian lustreware vessels were certainly very conscious and sometimes quite successful imitations of silverware. Sometimes a thin metal sheet (usually tin) was just glued to the ceramic surface, as for example on some Mycenaean vessels, or on some vessels of the Hallstatt Iron Age. Some of the medieval Chinese pottery which imitates the form of ancient bronzes has a dark green glaze which is surely imitating patination. Conversely do the Chinese cloisonné vessels with decorative scenes on a white ground covering the whole vessel imitate porcelain? and does this reverse imitation reflect the prestige of porcelain in China? These and other questions could have provided the basis for a more general paper on the interrelation of metal and ceramic surface treatment.

Some of the South Italian oinchoe of the 2nd century BC are a rather garish yellow probably imitating the colour of the bronze vessels they imitate in shape. A more contentious case is that of the relationship of the Greek red figure ware and silver. Michael Vickers has argued quite strongly through a number of papers that early Greek silver was given a black patinated surface and that the contemporary ceramic red figure vessels copy pattern-gilded silverware, the black body copying the putative blackened silver and the red areas the gilded figues. Most ancient silver has been polished before display, but some pattern-gilded silverware from Thrace is illustrated in *Thracian Art Treasures* with the black patina intact and it does bear a striking resemblance in colour and texture to red figure wares. In this paper Vickers develops his ideas still further and suggests that the white painted areas in the pots represent ivory inlay and the purple areas copper. But copper is red surely, ah, but oxidised copper is purple, (I fear that much of the argument proceeds at about this

level of improbability and ingenuity). He argues that the purple dots on the clay handles and the lines on the rims of the pots are representations of copper rivets and rim strengtheners. However, in reality there is no evidence for either ivory inlays or for the rim strengtheners on the surviving silver, and copper rivets only occur occasionally as crude repairs.

The whole thesis that the colour scheme on Greek pots was related to the colours once found on the contemporary silver, was an interesting idea when it was first proposed several years (and many papers) ago, and it has produced a lively and worthwhile debate (see Boardman's 'Silver is White' in *Revue Archaeologie* 1987 (2) for a rebuttal that quite matches Vickers in assertiveness). But unfortunately the debate has unearthed no evidence to support Vickers contention. There are a few literary references which could just be interpreted to mean that silver is dark, but only after considerable manipulation. For example, it is claimed that the philosopher Thrasyalces baldly states 'silver is black'. In fact the context of the statement shows that it is derisory, the writer was suggesting that poor Thrasyalces was so far removed from reality that he claims black is white or silver is dark. Possibly the most convincing reference is to be found in Pliny's *Natural History* where in Book 33 Cap. 46 he mentions that the Egyptians stained their silver, though this could be a reference to inlay with niello. Niello or its absence could be used as further evidence for Vickers' argument. This dense black material seems to have been known since Mycenaean times but is very rare before Roman times when it suddenly becomes very popular inlaid into silver. One could argue that if Greek silver was already black then inlaying with a black material would be pointless, hence its absence. However, negative evidence such as this is a fairly flimsy structure on which to base the whole hypothesis. Common experience is that silver is white and in order to sustain a theory radically in opposition to this one must produce convincing evidence. This Vickers has failed to do, beyond the painted pots themselves. Here there are far similar explanations, the two most common colours for painted pottery since its inception have been black and red, and the Greek black figure and succeeding red figure wares developed quite naturally out of the earlier Geometric wares. Thus it is not obvious why one needs to look for an outside inspiration in the first place, but if this is really necessary then possibly the much prized inlaid dark wooden Thericleian vessels could be the model.

The papers on this topic by Vickers and also by Gill are only two of the very thought provoking essays in this volume. Allan's hypothesis that the inlaid Islamic brassware was a substitute for gilded silver as a response to the postulated chronic shortage of silver is another controversial idea that requires careful study. The papers all provide a wealth of information coupled with challenging ideas and acute observations. Volumes such as this where common themes are followed across several cultures and thousands of years must be productive. Some more papers actually spanning the cultures would have been useful as indicated above, but I should be very surprised if the papers do not inspire further work. Do read it—it's fascinating.

REFERENCE: VENEDIKOV, Ivan & GERASSI-MOV, Todor. 1975 *Thracian Art Treasures*. London: Caxton Pub. Co. ISBN.

PAUL CRADDOCK

WAGSTAFF, J.M. (ed.) *Landscape and culture: geographical and archaeological perspectives*. Oxford: Blackwell, 1987. [6], 233 pp; illus. Hbk: £29.50; pbk: £9.50.

The editor of this volume suggests that archaeology and geography may be seen as two dimensions of a single field. They are, as it were, variations on themes in time and space.

There has long been a need for a coherent text on the interface between archaeology and geography and the present volume goes a good way towards meeting that need. It is an edited work with ten contributors who write about individual aspects of landscape and culture. Some papers, such as R. Dennell on prehistoric subsistence, are in the nature of general surveys of recent work whilst others are more specifically problem orientated, as for instance B. Robert's fascinating chapter largely concerned with the problems of classifying settlement morphology. Particularly positive as regards future developments is E. Grant's argument that recent advances in humanistic geography could contribute greatly to the much needed development of a theoretical basis for industrial archaeology. Some of the essays do not link in well with other parts of the volume which would have benefited from pre-circulation of papers among contributors. There are rather more typographical errors than one might expect for a text book of this type, in particular a figure on p. 90 has the wrong caption which is repeated on p. 124.

A major theme of the book is the similar histories of archaeology and geography as emphsised by A. Goudie's historical review. Both experienced similar crises in the 1970's with the questioning, particularly in geography, of positivism and uniformitarianism. I. Hodder shows how both disciplines have embraced symbolism, though in contrasting ways. Regarding future developments there are pleas for a greater geographical contribution to studies of past subsistence (by R. Dennell) and archaeological resource management (by P. Fowler) whereas R. Hodges argues that archaeologists must evolve their own spatial models which are specifically applicable to the nature of the archeological record.

Several chapters note the contribution which archaeology can make in helping to provide a longer time dimension for studies of landscape change and for the formation of laws for which present day analogies provide too restricted a basis. This aspect is, however, mainly developed in relation to cultural aspects of archaeology and human aspects of geography. An interesting example is J. Cherry's study of state formation which he describes as political geography in the past tense. The book's most serious deficiency concerns its very limited treatment of palaeoenvironmental studies and their contribution to elucidating the past history of present day landscape types. Only J. Tjornes really tackles these aspects with a plea for an ecological perspective on erosion involving the quantification of inputs and outputs. This is an important methodological point but there are considerable difficulties in an archaeological situation when it comes to quantifying such aspects as net primary productivity. Certainly this is the case without the detailed palaeoenvironmental data base which receives little emphasis in this volume as a whole. The same point applies to site catchment analysis which is mentioned by several contributors. Some weaknesses of this method are acknowledged. R. Dennell states it is only an appropriate technique when there has not been significant subsequent landscape change. But how common are such habitats with minimal human impact? Surely the hypothesis of insignificant impact needs in every case to be tested by palaeoenvironmental work.

P. Fowler's lively concluding chapter on archaeolgical resource managements makes a most laudable plea for more integrated preservation of archaeological and natural historical aspects. The case could have been strengthened by noting the extent to which our knowledge of many habitats, most obviously perhaps in the British national parks, depends on a history of archaeological and geographical palaeoenvironmental study.

The omission of palaeoenvironmental studies in the volume as a whole may be partly deliberate. It is true that these aspects are covered in a number of other texts, and it is equally true that some palaeoenvironmental studies have tended to neglect the social dimension, so it could be argued that a volume with emphasis on the social aspects will help to re-

dress the balance. Certainly it represents a valuable survey for which Dr Wagstaff deserves our thanks. It offers a critical perspective on recent developments which will be of considerable use to students. One hopes, however, that they will not believe that it covers the whole spectrum of activity in the fertile interface between geography and archaeology.

MARTIN BELL

WEBSTER, Graham, (ed.) *Fortress into city: the consolidation of Roman Britain, first century AD*. London: Batsford, 1988. 178 pp; illus. £19.95

The book contains studies in depth of five legionary fortresses and one auxiliary fort in Roman Britain and their development into civil towns. Dr Webster makes it clear there is no right time for a book which requires a line to be drawn across a continuing flow of new information but this book collects the evidence and opinions at the latest practical date and these would not be otherwise easily available. The original sources are well referenced.

The fortresses did not all follow the same route to civil status. Colchester, Gloucester and Lincoln became coloniae while Exeter and Wroxeter became civitas capitals. The auxiliary fort, Cirencester, grew into the second largest town in Roman Britain. Each site is studied separately which has the advantage of allowing the in-depth approach but makes it less easy to picture the contribution to the general pattern of consolidation.

Perhaps not a book for those expecting instant enlightenment but for archaeologists, certainly rewarding for those who persist. The plans and illustrations are a great help.

JOHN CLEMETSON

WHEELER, Alwyne and **JONES**, A.K.G. *Fishes*. Cambridge: Cambridge University Press, 1989. xiv, 210 pp; illus. (Cambridge manuals in archaeology) ISBN 0 521 30407 5 £32.50

This new volume in the Cambridge series is a long awaited over-view of the complex nature of this area of zooarchaeology. The collaboration of these two authors bring together a wealth of practical and theoretical experience in ichthyology and archaeology. The outcome is a confidently written and produced manual covering every aspect of what has been, up until now, a little known field of zooarchaeology.

The manual consists of 14 chapters which integrate both ichthylogical methodology and archaeological problems. The authors are critical of certain misleading texts which have gone before and, as a consequence, they clear up many misconceptions about the possible uses of fish remains in archaeology.

The core of the manual is a practical outline of fish osteology and species diversity, although it is not a 'species' identification guide. Skeletal elements are considered in groups, ie, head bones, vertebrae etc, showing differences between the main family groups. This section is well illustrated with detailed drawings which convey clearly such complex structures as the cranium and pectoral apparatus.

Other main themes are concerned with methodology, such as recovery, sampling and recording. Taphonomy and some aspects of fish ecology are also considered. The interpretation of archaeological assemblages, with reference to the reconstruction of body size, season of death, abundance, etc, are exhaustively covered, drawing on diverse archaeological examples.

The authors also suggest various ways of translating the data recovered into archaeologically-based economic resource models. The final chapter is extremely useful; it concerns the making, storage and curation of fish reference collections.

The manual is well written and researched and has a very comprehensive bibliography. Its potential value to the archaeologist is enormous, especially in the areas of economy, diet, trade, seasonality and fishing techniques. Its worth to the ichthy-archaeologist is indispensable.

BRIAN G. IRVING

WILLEY, Gordon Randolph *Portraits in American archaeology: remembrances of some distinguished Americanists.* Albuquerque: University of New Mexico Press, 1988. xiii, 426 pp: 16 plates. Hbk: $35.00; pbk: $19.50

Portraits in American Archaeology is a collection of anecdotal sketches of sixteen prominent figures in the development of American archaeology. There are no women in the book; perhaps none figured in New World archaeological development or Willey did not know them personally. The book says as much about the author as it does about his subjects.

It is difficult to assess this work as it falls between two stools; neither being wholly archaeological nor wholly biographical. Readers interested only in a biographical approach will find many of the archaeological passages difficult to understand. The author refers to a number of sites and projects assuming that the reader is already informed about them.

This collection of pen portraits includes; Byron Cummings, Arthur Randolph Kelly, James Alfred Ford, William Duncan Strong, George Clapp Vaillant, Wendall Clark Bennett, Junius Bouton Bird, Alfred Louis Kroeber, Samuel Kirkland Lothrop, Julian Haynes Steward, Matthew Williams Stirling, Alfred Marston Tozzer, Alfred Vincent Kidder, William Rotch Bullard Jr., Harry Evelyn Dorr Pollock, and Augustus Ledyard Smith. Aleś Hrdlička, America's archaeological Torquemada (who is sorely in need of reappraisal and a sound debunking and who must have been known to Willey) is singularly absent.

There is a great deal of hero worship and naivete in the book. There seems little point in including certain biographical details unless one is going to embroider on them. For example:

'On 13 May 1945, at his home in Devon, Pennsylvania, at the height of a brilliant career and seemingly in the midst of plans for another phase of it, George Vaillant, for no apparent reason, took his own life.' No one takes his life for no apparent reason; a multiplicity of reasons may exist and there is no point in mentioning the event in biographical terms unless one intends to explore those reasons.

On the whole, I thought the book a pointless exercise unless as a commemoration volume of the author's own long life in archaeology; a place that would have been better filled by Willey's own autobiography. The figures above mentioned would quite naturally cross its pages.

J. M. HOADLEY

WILSON, Roger, J.A. *A guide to the Roman remains in Britain.* 3rd edition. London: Constable, 1988. xvi, 453 pp; illus. (A Constable guide) £8.95.

This is the third edition of a book which has become indispensable for anyone who wishes to seek out the archaeological remains of Roman Britain. An indication of the increasing number of sites open to public view is shown in a comparison of this book with that of the first edition published in 1975. Excluding the appendices there are an extra 75 pages of text.

The second edition in 1980 was larger partly because of the great amount of excavation which took place in the 1970's. Since then, as

the author's preface indicated, although the rate of excavation has slowed down there have been 'major advances in our knowledge of Roman Britain' which meant substantial alterations to the text. The publishers allowed him to do this providing that the pagination was not affected. This has been skillfully done and a double asterisk placed in the margin alerts us to the change. Three sites, Carisbrook, Blackpool Bridge and Blackstone Edge have been excluded because they are deemed to be no longer Roman, and two, Kingsgate and Combley, have been backfilled. It is a reflection on changing circumstances that some remains, as in London, can no longer be visited for security reasons.

60% of the papers contain new material and, in addition, opening hours have been revised, the select bibliography updated and a supplementary section added which includes such additional material as the Silchester amphitheatre, the Caerleon fortress baths and the fort of Manchester, which was certainly not regarded as a Roman site thirteen years ago. This supplementary section is so useful that when the fourth edition is brought out, as it surely must be, this information should be included in a revised text.

The book is intended to be a handbook for use in the field. It will still fit into a large pocket or a handbag though the weight $1^1/_2$ lb may preclude it from being carried, with other impediments for lengthy periods of time. The directions for reaching sites are satisfactory although occasionally they do cause some hesitation as at Bartlow but the individual site information is admirable. The text is divided into ten areas and there is a gazetteer of visible remains not mentioned in the text. Its use will be appreciated both by the casual visitor and the Romano-British specialist.

JOAN P. ALCOCK

WILSON, David M. *The British Museum: purpose and politics*. London: British Museum Publications, 1989. 126 pp; 22 plates. ISBN 0 7141 1714 5 £4.95

Just in time for 'Museum Year '89', Sir David Wilson, the director of the British Museum, has written *The British Museum—Purpose and Politics*. The defensive nature of his work strongly reflects the increasing demand for accountability within museums. In his preface Wilson states that 'this book stems from impatience.' Although he doesn't state the source of his impatience, it becomes quickly apparent that the public, the media, and the government all form the combined angst of David Wilson. Although the book tends to be overly defensive, the director of the British Museum has indeed written a convincing, stimulating, and comprehensive treatise on the British Museum.

The book is primarily aimed at museum professionals and enthusiasts—and perhaps the 6,000 members of the British Museum Society. The 'purpose and politics' of the title is rather misleading and overly sensational for the actual content. As current director of the British Museum, Wilson is representative of the museum and could hardly be expected to take controversial stands and reveal 'behind the scene' intrigues. He includes a brief mention of the Elgin marbles that appears above all cursory and obligatory. The controversies that Wilson attacks with vigour are those about the reorganization of the Front Hall and the issue of charging for admission. His discussion of the latter is both thorough and convincing. Wilson's position against charging has been under a constant fire and he is quite adept at defending it on both moral and economic grounds.

Besides the first chapter about the history of the British Museum, each subsequent chapter reiterates one theme; the British Museum does not have enough money. By April 1990, the Museum faces a one million pound deficit. Most people can not conceive of this amount of money, especially when it is related to a

large institution that contains an abundance of the world's most valuable treasures. Wilson therefore makes his point very effectively by breaking down the sum and the multifarious costs incurred by the daily running of the British Museum.

Wilson's perspective encompasses past precedents, present predicaments, and future endeavours. He predicts what future costs the museum faces, such as building rennovation (World War II damage still needs to be repaired,) computerised inventories, and new galleries. The imminent departure of the British Library will re-unite the Dept. of Ethnography and allow for general expansion. In April 1990 the new Japanese galleries are set to open, largely made possible by fund-raising in Japan.

Therefore, Sir David Wilson's book presents a great defense against the British Museum's current criticisms, and at the same time justifies its costs. In doing so the book offers great insight into the whole spectrum of museum functions, from a director's comprehensive view. It is at times tiresome in the repeated cry for funds and praise for all that the Museum accomplishes. Nonetheless, Wilson writes that his book is 'a plea for understanding and help,' which it quite successfully achieves.

KAYWIN FELDMAN

WINCHESTER, Angus J.L. *Landscape and society in medieval Cumbria*. Edinburgh: J. Donald, 1987. 178 pp; illus. £20.00

Landscape and Society in Medieval Cumbria is a model study in man's use of and effect on the countryside. It covers roughly a 500 year period, from the Norman incursions into the region to the end of the Elizabethan age, but often reflects back into earlier periods or projects forward into later times. It cites primarily documentary evidence, but makes use of physical evidence on the land wherever possible or relevant, including field systems, walls and other physical boundaries, remnant forests and cleared areas, cropmarks, fieldmarks and fieldworks, and standing buildings, but not excavated materials.

Several sets of themes are stressed throughout the book: the continuity of some practices, customs and traditions in Cumbria from very early periods alongside changes brought in by the Normans and later, together with similarities and differences between medieval developments in Cumbria and elsewhere in England and Wales; the evolution of medieval Cumbria's landscape in terms of environmental constraints and economic determinism, and cultural factors which regulated men's choices and decisions in changing their environment (particularly changing settlement patterns due to human design and to crop failures, stock fluctuations, plague and warfare); the endurance of an upland versus a lowland dichotomy and changes in each through the medieval centuries; the shifting relationship between authoritarian versus 'inheritable' or traditional rights amongst feudal landowners, farmers and pastoralists, and a rising lesser gentry; and the contrast between, but firm interdependence of, the rural sector and the growing borough/market towns.

Details and examples are given on land ownership; on population fluctuation; on the growth and evolution of farm and field, village and town; on farming, stock-breeding, woollen and other industrial practices, and on the uses of important local resources—pasture, moorland, fellside, woodland, water and mined ores; and on the development of mercantilism in market towns. Periodic reference to and assessment of Cumbria's relationships and connections with the rest of medieval England is also made.

The book has an introductory chapter *(The countryside in the medieval North)*, six thematic chapters *(Lordship and territory; Village and farmstead; Farms and fields; Moorland and fell; Woodland and water; Rural in-*

dustry and market towns), and a summary conclusion; plus an appendix *(The medieval landscape reconstructed)* which examines six Cumbrian townships in detail, reconstructing their landscapes and changing tenure patterns across the medieval centuries. Thirty-nine maps and figures and six tables illustrate specific themes. A glossary of medieval terms, extensive notes for each chapter, bibliographies of primary and secondary sources, and an index all contribute to the usefulness of this scholarly, well-written book. Angus Winchester is to be congratulated.

DAVID M. JONES

WOOD, B., **MARTIN**, L. & **ANDREWS**, P. (eds.) *Major topics in primate and human evolution*. Cambridge: Cambridge University Press, 1986. [13], 364 pp; illus. £19.50

This symposium volume resulted from a special meeting of the Primate Society of Great Britain and the Anatomical Society of Great Britian and Northern Ireland. Its specific concern was to consider the definitions of, and relationships among, taxonomic groups of primates. The contributions were clearly designed to consider aspects of primate differentiation, including hominid evolution. There was also clearly the intention to provide contrasting points of view regarding some evolutionary problems, perhaps especially as regards different interpretations resulting from palaeontological versus molecular findings. Thus, there were papers along these lines on catarrhine primates as well as the hominids.

The primates are usefully introduced and defined by R.D.Martin, with studies on Tarsiiformes, the monkeys and the anthropoid transition providing a further basic primate background. Lawrence Martin debates in detail the relationships between extant and extinct great apes and human groups. Because dental remains often preserve and fossilize better than bone, and also show considerable evolutionary variation, it is not surprising that there are three papers varyingly concerned with teeth (Butler, Dean, and thirdly, Jungers and Grine).

The final third of the volume is concerned with a more detailed consideration of the levels of hominid evolution, from the australopithecines, through (if not around) *Homo habilis* and *Homo erectus*, to our own dubiously classified species *Homo sapiens*.

There is plenty of information and discussion here, with perhaps many of us disagreeing with some of the points made or positions held. But that is the nature of Primate studies, and its fascination. My one grumble is that the contributors include too many of the old brigade, whereas it would have been good to use this symposium as a platform for younger researchers in the field.

DON BROTHWELL

ZACHAR, Lev. *Keltische Kunst in der Slowakei*. Bratislava: Tatran, 1987. 159 pp; 208 col. plates; 2 maps; chart. Kc's 150.00

This large format, if slim volume provides magnificent colour photographs of La Tène artifacts from Slovakia, the third, eastern province of Czechoslovakia. This region has produced large La Tène inhumation cemeteries of the kind familiar further south (in Hungary) and west, and much of the illustrated material would not cause surprise in, for example, Switzerland (swords and decorated scabbards, girdle chains, some of the fibulae, bronze and glass bracelets). However, other objects have an exclusively east European flavour. This applies not only to pottery and coins that would be expected to have a local stamp, but also to some bronzes, especially bracelets and anklets with versions of what clearly represents Jacobsthal's Plastic Style of 'Early Celtic' art but with a degree of exuberance (or vulgarity, according to taste) that is extreme even for this extremest of La Tène art styles.

The photographer, Petr Paul, has recorded all this material, whether of clay, iron, bronze or glass with extreme skill and he is superbly served by the printer. Inevitably a price has to be paid for this visual excellence and the book as a whole is designed to appeal to the coffee table market as well as to archaeologists. The brief text in German does not refer specifically to plates or text figures, and the plate captions themselves often confuse, failing for example to relate enlarged details to their parent objects. These lacunae are only partially filled by the plate 'Catalogue' which provides dimensions and museum locations but too often not exact provenances and so it is not clear which objects were found in association. This is not quite as devastating as it could be since a good bibliography is provided and so with diligence and access to Czech periodicals and texts it should be possible to track down such details.

The concessions which have been made in this album of colour photographs, for such it may seem, are in my opinion fully justified. If more prehistoric material could be republished this way, the specialist would be presented at reasonable cost with a further level of primary evidence and others could enjoy and perhaps be startled by such strange images of the past.

ROY HODSON

Errata

The following misprints were made in the Reviews' section of *Bulletin 25*. We apologise to both authors and reviewers for any embarrassment this may have caused.

Page 117: Hermann Palsonn *should read* Hermann Pálsson

Page 185: Mark Zvelebil *should read* Marek Zvelebil

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Notes to Contributors

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1) *Typescripts* should not normally exceed 10,000 words in length. They should be typed on one side only of A4 size paper (approx. 30 cm by 21 cm), using double spacing and leaving wide margins (at least 4 cm on the left). Two copies of the typescript should be submitted, the author retaining a third copy (complete with duplicate figures, plates and tables).

2) *Footnotes* should be avoided as far as possible. If any are judged to be absolutely necessary, they should be typed on a separate sheet, not at the foot of the page to which they refer.

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for a **book:**

Butzer, K.W. 1972 *Environment and Archaeology*. London: Methuen.

for an **article in a book:**

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